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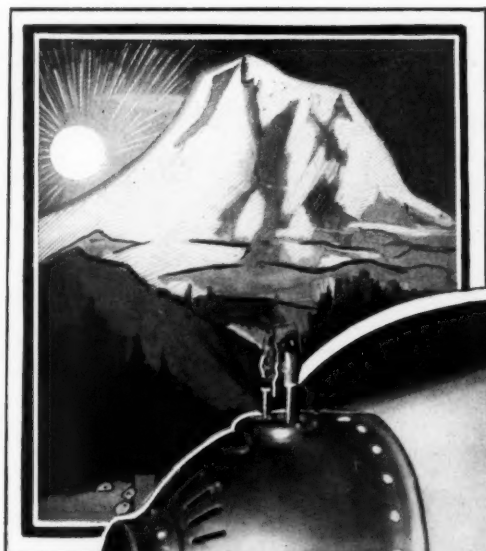
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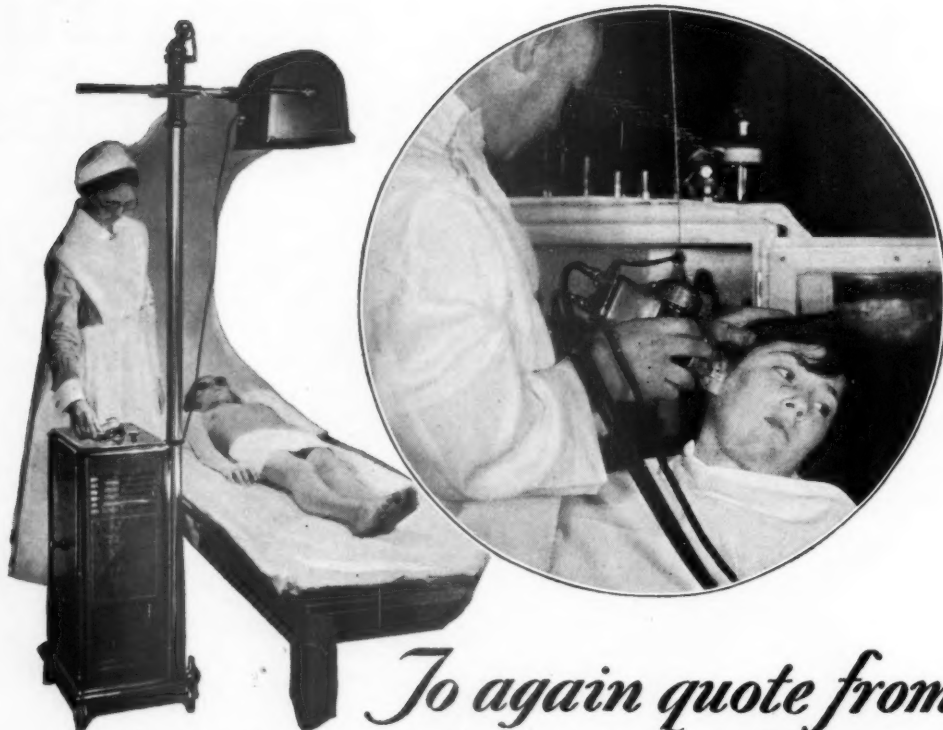
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# ARCHIVES OF PHYSICAL THERAPY, X-RAY RADIUM

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No. 1

## ELECTROTHERMIC SURGERY, RADIUM, AND ROENTGENOTHERAPY IN THE MANAGEMENT OF MALIGNANT DISEASES OF THE EYE, EAR, NOSE AND THROAT\*

J. THOMPSON STEVENS, M. D.  
MONTCLAIR, N. J.

When Dr. Hollender invited me to come to Chicago to discuss with you malignant diseases of the eye, ear, nose, and throat at the seventh annual meeting of the American College of Physical Therapy it appeared to be a simple matter to cover the subject, but it was soon found that the discussion would have to be limited to some of the more common malignancies because of the limitations of time, also for the same reason much would have to be left unsaid. Therefore, because of the magnitude of this assignment this paper will be limited to the consideration of malignant diseases of the eye, ear, nose, nasal accessory sinuses and the mouth, including the lip, tongue, tonsils, buccal surfaces, and the larynx.

### ELECTROTHERMIC SURGERY

Medical men everywhere hesitate to advise new methods of treatment. However, once he adopts electrothermic surgical procedures and works with this method long enough to perfect his technique, he will not return to the older methods, particularly in the surgery of malignancies. For instance, in a personal communication, Howard A. Kelly stated, "I call it the new surgery; it is the biggest thing that has come into the surgical realm for many a year. We are using it every day and it is invaluable in some

of the cases, either where radium fails or where the use of radium has so far altered the tissues that it is impossible to go ahead with it. One beauty of this form of treatment is that it can be so sharply and definitely localized, can be used repeatedly in the same area, and that the wounds consequently are generally not at all painful and healing is so beautiful."

The advantages of operating by electrothermic methods are now so well known that they will only be restated briefly. As compared with excision, it has the enormous advantage, in accessible cases, of *destroying the malignancy before it is removed*. It is impossible to overestimate the value of this fact, that with electrothermic methods the growth is removed as a mass of dead tissue instead of as a mass of viable cells. This, plus the fact that the blood-vessels and lymphatics supplying and draining the affected area are closed, tends to remove the possibility of mechanical metastasis. As compared with all other methods of cauterization by heat, the active electrode is cold at all times. Heat develops in the tissues treated because of their resistance to the flow of the current. Therefore, it is progressively more penetrating the larger the amount of current used and the longer it is applied. The actual cautery, as we all know, rapidly heats the tissues to which it is applied to a very high temperature, the tissues being charred if the heat is applied long

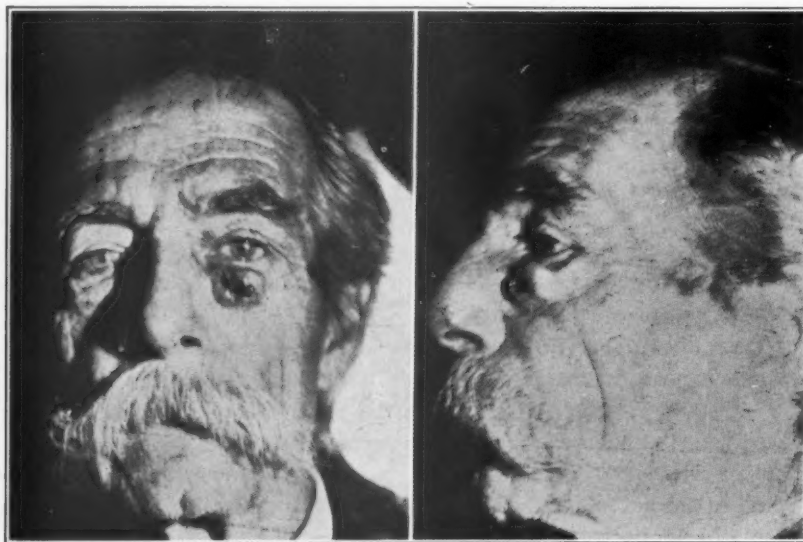
\*From the J. Thompson Stevens clinic for Radiation Therapy and Electrothermic Surgery.

\*Read at seventh annual meeting, American College of Physical Therapy, Chicago, Oct., 1928.

enough. However, the actual cautery does not produce sufficient heat deep within the tissues and, therefore, the results by means of the actual cautery fail to compare with those obtained by means of electrothermic methods. The above statements apply to the correct execution of the operations by electrothermic methods known as desiccation, coagulation, and the use of the surgical diathermy current for excision purposes.

not localized or accessible the only hope lies in intelligent and thorough irradiation.

Roentgen rays are indicated for irradiation of large regions, such as lymphatic drainage fields about malignant processes. Also, they are the agent of choice when areas of healthy tissues or organs must be traversed by the roentgen rays before reaching the parts to be treated.



No. 1.—Before treatment.

No. 2.—Before treatment.

#### IRRADIATION THERAPY

Irradiation therapy is always indicated whenever and wherever a malignant disease is found, no matter what other treatment appears to be indicated. Even though the disease is localized and accessible, the treatment had probably better begin with thorough irradiation. This reduces the resistance of malignant cells, decreases circulation through the radiated parts, and tends to prevent the possibility of mechanical metastasis taking place during the local attempt to eradicate the disease. This applies equally whether the gross disease is to be removed by electrothermic methods, by the implantation of radium, or by simple excision. Postoperative irradiation is indicated, but is not nearly so valuable as the preoperative treatment because no one can be sure after eradication at what distance from the primary growth malignant cells might be found. In cases that are

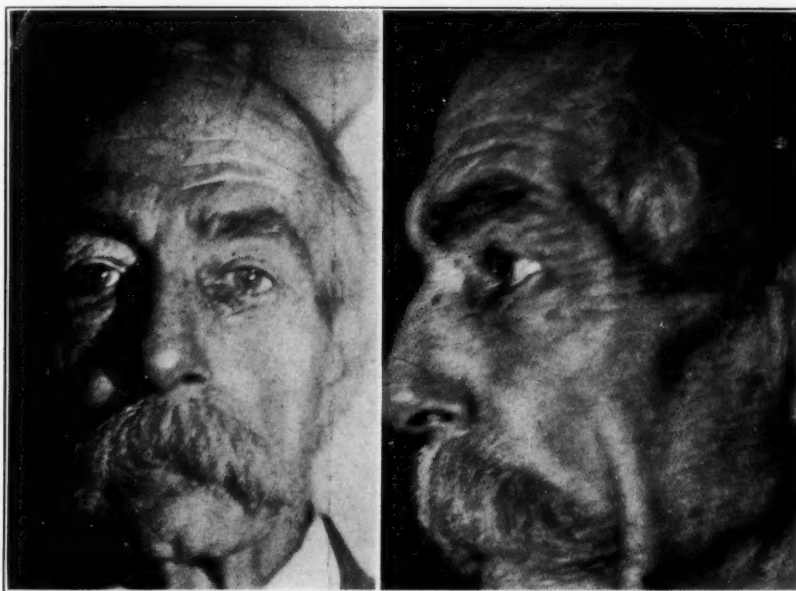
Radium is the agent of choice when an intense local irradiation is indicated. To be most efficient it must be brought in direct contact with the tissues to be irradiated or, better, it should be buried deeply into such tissues when possible. Either by burying the radium in several areas, or by correct filtration, the radiations should be as nearly homogeneous throughout the entire new growth as can be obtained. Generally, however, roentgen rays and radium can be combined to produce maximum effect.

The methods of applying the radiations in the treatment of malignant diseases are important. The fractional method, which I used years ago resulted in successes that were so unstable that I readily changed to the more modern massive high voltage technic on its introduction in our country. The results from the latter method were so unsatisfactory in practice that

it was not difficult for me to comprehend the possibilities of the fractional saturation method as advocated by Pfahler.

This method has now been in use by me during the past eight years. It provides for the use of all that appeared good in both of the earlier methods of treatment, that is, the use of the high voltage rays, applied in small dosages at short intervals, to arrive at the 100 per cent saturation point within a few days after treat-

like, frequently have local recurrence and other forms of treatment appear to be indicated in many such cases. Electrothermic methods and radiation therapy appear to meet the indications perfectly. Correctly applied the disease is thoroughly destroyed and removed, a fine, soft, elastic scar results, and recurrence is the exception. If treated by these methods while only the skin is involved 100 per cent recoveries should be realized.



No. 3.—After treatment.

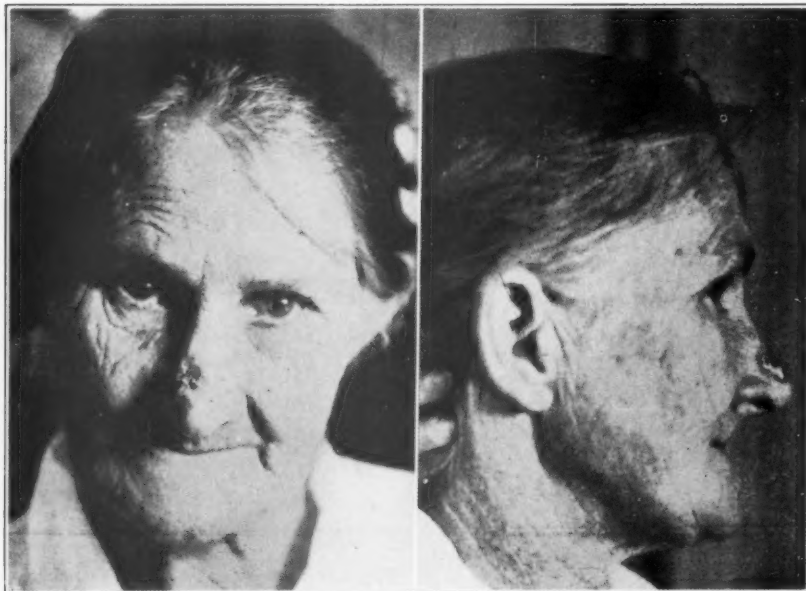
ment is instituted, and by subsequent irradiation to keep the radiations within the treated parts up to this 100 per cent point for several weeks. The one drawback to this method of treatment is, of course, the tremendous amount of work that must be done in each individual instance. In spite of this it was gratifying to find during the past two years, when reviewing the statistics of some thirty-three foreign and domestic clinics, that each used almost exclusively the plan of treatment as outlined above.

#### CARCINOMATA OF THE SKIN

Most skin carcinomata of the face, occurring above the upper lip, about the nose, eyelids, etc., are of the basal cell type and are comparatively benign in form. However, in my experience, patients who have had acid treatments, currettings, cutting away operations, and the

#### CARCINOMATA OF THE LIP

Squamous cell carcinomata are prone to occur at points where skin and mucous membrane meet and this is the type that is found about the lip—most frequently the lower lip. In the past thirteen years, in my clinic, only one carcinoma of the upper lip has appeared. These are very malignant and produce metastasis. If all fissures, cracks, ulcers, warts, and wart-like lesions are thoroughly destroyed and removed by electrothermic methods, carcinoma of the lip can usually be prevented. Once the disease is established, very thorough treatment is indicated. This should consist of thorough irradiation of the submental and cervical lymphatics and the lip. The actual growth is then destroyed and removed by electrothermic methods, and radium element is buried deeply into the coagulated base. If so treated before metastasis has taken place, about 80 per cent of the cases recover;



No. 4.—Before treatment.

No. 5.—Before treatment.



No. 6.—After treatment.

No. 7.—After treatment.

after metastasis has occurred the treatments seldom prove more than palliative. Syphilis has appeared frequently in my clinic associated with carcinoma of the lip, and this combination of diseases is generally followed by failure even under the best of radiotherapy, surgery, and antisyphilitic measures.

#### MALIGNANCIES OF THE EAR

If epithelioma of the skin of the auricle is

treated thoroughly and skillfully by electrothermic methods and irradiation, recovery is almost certain. If the cartilage is involved, none but the most skillful and thorough treatment can hope for success. In this stage of the disease it is undoubtedly best to remove the entire auricle by electrothermic methods and to thoroughly irradiate the site of the auricle and all of the lymphatics draining the diseased area with roent-



gen rays. When the bone is involved, or cervical metastasis has taken place, permanent recovery is the exception. The best of treatment is seldom followed by more than palliation.

Primary malignancies of the middle ear are very rare. At the Basle Clinic, out of 45,000 ear cases only six had primary malignant disease of the middle ear. However, these cases being of the squamous cell or squamous cell adenocarcinoma type, very thorough treatment is indi-

The larger malignant lesions of the eyeball including recurrences, frequently demand that the eye be sacrificed. In these cases, the treatment should always begin and end with thorough irradiation. Following preliminary irradiation, the eye can be removed by electrothermic methods and radium element packed into the orbit. Then repeated roentgen treatments should be given to give maximum protection against recurrence.



No. 8.—Before treatment.

No. 9.—After treatment.

These pictures show the only sarcoma of the upper lip treated here during past 12 years. Seventy some cases of lower lip have been treated.

cated. In most cases probably the diseased bones had better be destroyed and removed by electrothermic methods and radium element packed into the wound against the coagulated base. Roentgen rays are indicated for irradiation of the lymphatics draining the region.

#### MALIGNANCIES OF THE EYEBALL

Carcinomata, sarcoma and gliomata occur upon or within the eyeball. If small and accessible, there is probably no better method of treatment than to remove the lesion by electrothermic methods. The operation is preceded and followed by irradiation therapy. These growths should give nearly as good results as malignant lesions of the skin. Great skill is needed here and it is possible to remove these lesions and leave very little scar, frequently with no impairment of the function of the eye.

#### RETROBULBAR SARCOMATA

The operative and irradiation treatment of retrobulbar sarcomata together with irradiation of recurrent growths, gives such poor results that this method of treatment is not to be advised. On the other hand, radiation therapy alone has been successful in a few cases of this disease when applied by one especially skilled in its application, and is, therefore, the treatment of choice among those who have had considerable experience with all methods of treatment in this malady. L. Webster Fox, for instance, would today probably not advise any other method of treatment than that of correctly applied roentgen ray or radium. If used early in the course of the disease, results can be obtained without injury to the normal tissues. The irradiation method of treatment is, of course, open to criti-

cism because no microscopic study of the diseased tissues can be made and the diagnosis is therefore often not proved.

#### MALIGNANCIES OF THE MOUTH

Malignancies of the mouth, including those of the inner surfaces of the cheeks, the tongue, tonsils, floor of the mouth and gums are frequently associated with syphilis; therefore, even in the absence of any history of venereal infec-

When the tongue and tonsils are involved, before the operation by electrothermic methods is attempted the lingual branch of the external carotid arteries must be ligated; otherwise fatal hemorrhage may occur at the time the slough separates and comes away.

At this time I wish to report a rare case, the only one of its kind that I have ever seen or heard of—a lymphosarcoma of the tongue.



No. 10—Before treatment.

No. 11.—After treatment.

tion, a Wassermann test should always be taken even though the lesion present has already been proved to be malignant. Likewise when definite improvement does not follow three weeks of anti-syphilitic treatment any buccal lesion should be looked upon as malignant until its status is definitely proved.

Malignancies of the mouth are of the squamous cell type, a type greatly resistant to irradiation. Metastasis and death is the rule, if neglected. The indicated treatment consists of thorough roentgen irradiation of the growth and all of the draining regional lymphatics. The growth is then destroyed and removed by electrothermic methods, and radium element needles are buried deeply into the coagulated base. Later, further roentgen ray treatments are given.

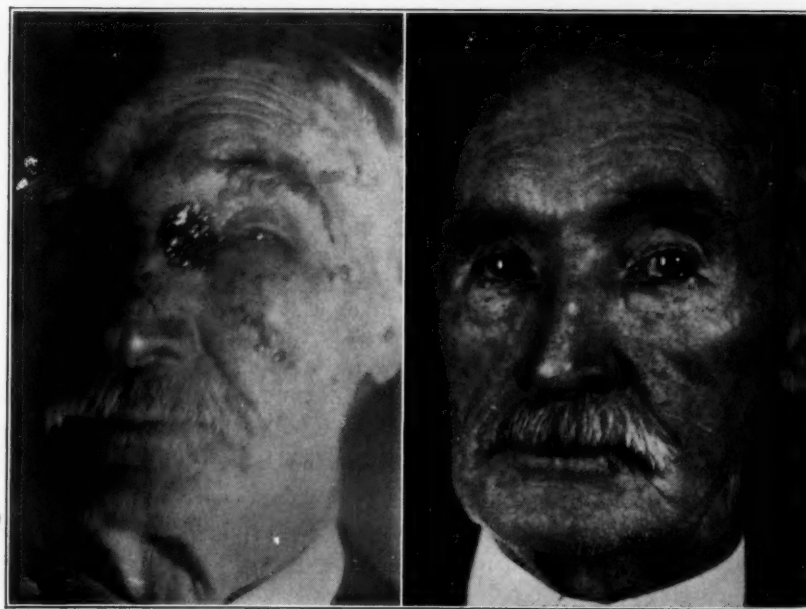
Mr. L. A., referred to me by Drs. James W. Atkinson and T. Vincent Connolly, April 8, 1927, age thirty-seven, a day laborer. The difficulty was first noticed in the summer of 1926 when the patient had a very sore throat. Since this attack the throat has remained sensitive. Four months ago there developed a sensation of fullness as though something were growing at the left base of the tongue. For the past three weeks talking and swallowing has been very difficult because of the size of the mass. Examination showed a mass the size of a butternut of the tongue opposite the left tonsil. Dr. Gay B. Kim, pathologist, reported with some doubt that the growth was a lymphosarcoma.

Ordinarily, lymphosarcoma gives beautiful results with correctly applied roentgen rays or



No. 12.—Before treatment.

No. 13.—After treatment.



No. 14

This type of skin cancer has given practically 100 per cent recoveries for five years and longer.

radium. Therefore, roentgen ray treatments were instituted and the site of the disease and all of the lymphatics draining the region were thoroughly irradiated. Plans were made to ligate the external carotid arteries and to destroy and remove the growth together with a part of the tongue two weeks later, also to bury radium

needles throughout the base of the tongue and tonsil. Examination April 22, 1927 showed the mass nearly gone. This was typical of lymphosarcoma as the growth had almost entirely disappeared within two weeks following the first series of roentgen ray treatments. Roentgen ray treatments only were therefore repeated on

May 13 and June 3, 1927, at which time there was no visible evidence of the disease. July 23, 1927 the patient was discharged from treatment to follow up service. Patient was last seen June 22, 1928, fourteen months since treatments were completed and he appears to have a perfect result.

#### MALIGNANCIES OF THE ANTRUM

Sarcomata and carcinomata of the antrum have been observed in my practice. Treatment

nicely repaired by a dentist. Following removal of the disease the antrum is packed with radium element and treatment is completed by several postoperative series of roentgen ray treatments.

#### CARCINOMATA OF THE LARYNX

If the disease is localized to a small enough portion of the larynx to permit of complete removal, electrothermic methods following preliminary irradiation would appear to be one of our best methods of treatment. This is prob-



No. 15—Carcinoma of the tongue before and after treatment.

of these diseases always begins with thorough irradiation of the antrum and all of the lymphatics draining the region with roentgen rays. Two weeks later this is repeated. In a few cases the disease has been practically eradicated by such treatment; sarcomata generally giving the more striking results. If the signs of definite improvement are not noted at the time of the second series of roentgen treatments, destruction and removal of the diseased tissues is indicated. For this operation there are two routes: One through the roof of the mouth or the floor of the antrum; or the cheek over the diseased side can be turned back and entrance to the antrum gained through its anterior wall. The latter is the route that I like best but, quite naturally, the patient generally prefers the former because no damage is done to the face and the deformity of the roof of the mouth can be

ably best done by laryngofissure, because one skilled in electrothermic surgery might not be equally skilled in the manipulation of the laryngoscope. Whichever route is selected the work must be completed by several series of postoperative irradiation. This is the plan of treatment that I would advise if one of my own family had this malady in an early stage. However, most of the cases that have come to my notice have been in an advanced, hopeless condition where not even palliation could be expected to follow any method of treatment. In these, roentgen rays by the saturation method have been used. Some received slight relief, others were markedly relieved, but in the end, all died of the disease.

Prof. Regaud of the Curie Institute, Paris, has had considerable experience in the roentgen ray treatment of early carcinoma of the larynx

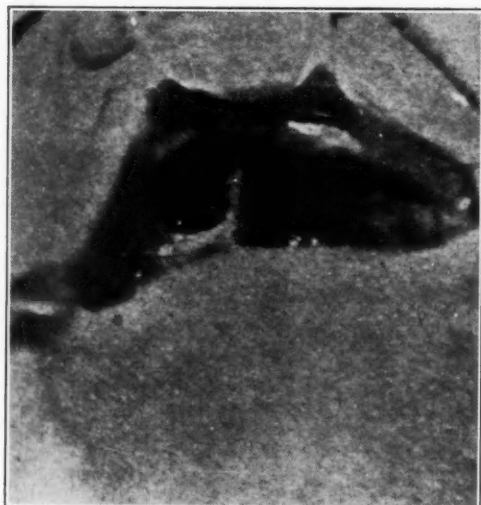


and reports twelve cases; eight are clinically well from one to three years; four resisted treatment, one was operated, and one died.

#### CONCLUSIONS

1. The electrothermic operative technique is described at some length, and the various methods of applying radiation therapy are mentioned. The principle involved in application of the saturation method of irradiation is stated.

2. Malignancies of the face, including those of the eyelids, auricle, and lip; together with those of the buccal cavity, eyeball, antrum, and larynx are mentioned and a plan for their treatment by means of electrothermic methods, radium, and roentgen rays is briefly stated.



Malignancies of the antrum after treatment by electrothermic method and radiation therapy. Deformity was corrected by a dental plate.

3. Local attempts to eradicate malignancies of the eye, ear, nose and throat, by excision, electrothermic methods, or by radium should not be done without first thoroughly irradiating the region affected with the roentgen rays or by radium packs. If treatment is begun by any such localized procedures, mechanical metastasis is almost sure to follow.

4. From the discussions included it would appear that electrothermic methods and irradiation therapy are of distinct value to men interested in the treatment of malignant diseases of the eye, ear, nose and throat.



Before Treatment: Extensive squamous cell carcinoma of the entire tongue and floor of mouth, showing deep ulceration.

After treatment: The entire tongue was removed by electrothermic surgery, together with destruction of the floor of the mouth. Radium element needles were buried in the coagulated root of the tongue and floor of the mouth. Roentgen treatment was added. This photograph shows the result with artificial cotton tongue. Patient talks better than before treatment and by paying close attention every word can be understood.



## PHYSICAL THERAPY IN FUNGUS DISEASE\*

A. F. TYLER, B. Sc., M. D.

OMAHA

### SPOROTRICHOSIS

This disease is the most common of the fungus diseases of man. It manifests itself as an indurated subcutaneous area which slowly enlarges and later opens as an ulcer through the skin, or as in some cases the fungus gains a foothold through an abrasion in the skin. At the same time that the primary lesion is growing larger the lymph vessels leading from that point become palpable and each lymph gland distinctly enlarges.

### ETIOLOGY

The cause of this disease was first described by Schenek, 1898, under the title "On Refractory Subcutaneous Abscesses Caused by a Fungus Possibly related to *Sporotricha*," Johns Hopkins Hospital Bulletin 1898, page 286. Other investigators confirmed his findings, the sporotrichium being possible of demonstration in every case. It is frequently difficult to locate the fungus in the primary lesion but careful search here and in the secondary lymph glands will reveal it. The specific organism is a dumb-bell shaped fungus which can be demonstrated by the hanging drop method or can be cultured on most laboratory culture media.

### PATHOLOGY

The disease is most common in France, with the United States a close second, but is reported from all parts of the world. It is doubtless much more common in the United States than formerly thought. The lesion is usually cutaneous and subcutaneous although cases are on record where systemic involvement had occurred. The fungus has been cultured from the blood of a patient with cutaneous sporotrichosis (Widal and Andre). The disease is more common in young people. In 74 cases collected by Sutton, the youngest was 5 years and the eldest 78 years of age. Seven-eighths of all the cases reported in the United States are from the Mississippi Valley.

\*Read at sixth annual meeting, American College of Physical Therapy, Chicago, Nov. 3, 1927.

### SYMPTOMS AND PHYSICAL FINDINGS

The primary ulcer usually occurs on the legs or arms, (the exposed portions of the body) and the lymphatic involvement follows in rapid sequence. See Figure 1.

The proof of the diagnosis is the demonstration of the specific fungus.

### TREATMENT

Potassium iodide should be given to physiological tolerance and continued until some



Fig. 1.—Case No. 18793. F. A. Photograph of girl eight years of age showing primary ulcer over the outer malleolus with lymphatic involvement up to the groin.

Fig. 2.—Lateral view of ulcer over outer malleolus.

time after the ulcer is healed and the induration has disappeared. Some recommend moist dressings of Lugol's solution applied to the ulcer.

Roentgen rays applied to the ulcer and the infected lymphatic vessels and glands is very helpful. Where roentgen ray is employed there should be no irritant dressings used on the areas treated. On the ulcer a good technic for roentgen ray dosage is as follows: seven inch spark gap, one mm. aluminum and leather filter, 10 inch distance, 5 ma. of current, 10 minutes. This dose can be repeated in two weeks. For the lymph glands, if subcutaneous, the same technic may be used.

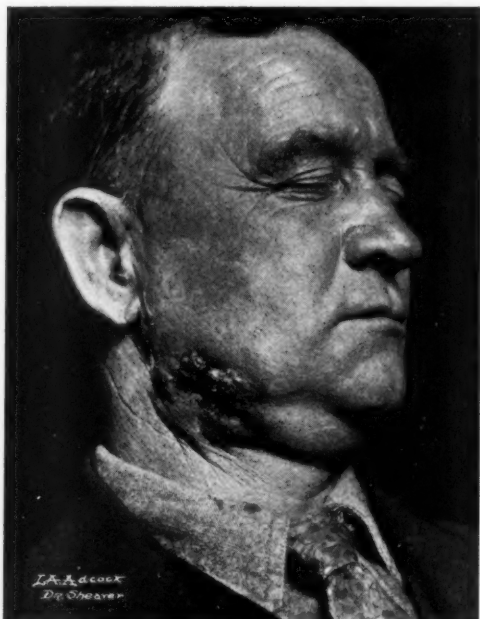


Fig. 3.—Case No. 19418. Mr. J. L. A. Actinomycosis of the right submaxillary region. Note the induration, nodules and sinuses all present at the same time. This patient cleared up nicely under the treatment described above.

#### ACTINOMYCOSIS

Actinomycosis of the skin is a disease due to the ray fungus, characterized by a reddish, nodular infiltration of the soft tissues with a tendency to the spontaneous formation of sinuses. The disease most commonly affects the cervico-facial region. It may be primary about the socket of a tooth.

#### ETIOLOGY

Israel and Harz were the first to describe the specific organism in the disease in man,

though "lumpy jaw" had long been known in cattle. The ray fungus gains entrance through an abrasion in the buccal mucous membrane and is most often found in farmers who have the habit of chewing straw and grass as they go about their work. After the fungus has taken a foothold it slowly invades the tissue, involving not only the soft tissues, but frequently the bone of the jaw. The fungus is found in hard granules which feel like grains of sand and when crushed on the glass slide are seen to be arranged in clusters radiating out from a common center like the spokes of a wheel. The ends of the mycelial threads are club shaped.

#### PATHOLOGY

The fungus infiltrates the soft tissues underneath the jaw and sooner or later causes nodules to appear in the skin over the affected part. These nodules then soften and rupture spontaneously, causing multiple sinuses from which



Fig. 4.—Case No. 20354. Mr. R. S. Roentgen ray films of the lower jaw in a case of actinomycosis with involvement of the bone.

seropurulent material is discharged in which is found the specific dirty, yellowish, gray granules characteristic of the disease. Macroscopic examination makes one positive of the diagnosis when these granules are found even before viewing them under the microscope. In some cases the jaw bone becomes involved (Figure 4). In others a general systemic infection occurs, resulting in death.

#### SYMPTOMS AND PHYSICAL FINDINGS

The patient notices an indurated area about the submaxillary region which later becomes nodular, followed in due time by abscess formation and spontaneous rupture with many small sinuses. The affected skin becomes reddish in color and pain is noticeable though not severe.

On physical examination the area is found indurated, nodular and the pus contains the characteristic granules containing the ray fungus. Roentgen ray examination of the jaw will frequently show an area of decalcification along the superior border which corresponds to the area of soft tissue disease. When this bone is explored surgically, it is found to be soft and mushy and in this mass the ray fungus can frequently be demonstrated.



Fig. 5.—Photograph of patient with blastomycosis involving the nose and cheek. (Courtesy of Dr. M. G. Wohl.)

#### TREATMENT

Where there is bone involvement, the diseased area should be thoroughly removed by a competent oral surgeon. As the nodules in the skin soften, they should be incised and the contents pressed out, the cavity then swabbed with tincture of iodine.

Roentgen ray should be applied thoroughly over all the indurated area, a dose sufficient to produce epilation being used.

The patient must take potassium iodide internally to the point of tolerance as long as there

is any induration in the tissues, and for several weeks afterward so that every bit of the fungus is certainly killed.

The roentgen ray or radium must be repeated as often as the skin will tolerate it. Liquefaction takes place much more rapidly where radiation therapy is employed.

#### BLASTOMYCOSIS

Gilchrist first described the specific cause of this disease in 1896. Blastomycosis of the skin begins as a papule which slowly enlarges in the course of a few days to 1.5 cm. in diameter. The center then breaks down and becomes covered with a crust. When the crust is removed a seropurulent fluid is found under which is a papillomatous appearing base. The border of the ulcer is elevated, reddish in color and moderately infiltrated. The disease extends by slowly infiltrating the surrounding tissues.

#### ETIOLOGY

Blastomycosis is caused by yeast fungus which gains entrance on the exposed parts of the body, hands and feet, through some slight abrasion. It is more common in men past middle life.

#### PATHOLOGY

The disease may cover a considerable area, is slow in progress but seldom recedes spontaneously. Systemic infection may occur though some think the avenue of entrance in systemic infection is through the respiratory passages. Systemic infection is usually fatal.

#### SYMPTOMS AND PHYSICAL FINDINGS

An ulcer small at first, slowly spreading laterally with elevated margins and the presence of yeast fungus, make the diagnosis positive.

#### TREATMENT

Roentgen radiation to the affected part to the point of epilation, repeated as often as possible, combined with potassium iodide internally, gives good results. The disease is stubborn and unless completely eradicated, quickly recurs. Some resistant areas may require surgical excision.



## THE DIAGNOSIS OF NON-TUBERCULOUS PULMONARY DISEASES\*

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CHICAGO

The study of a case of pulmonary disease should always begin with the taking of a careful history of the patient's illness. Especially important are the family history with reference to tuberculosis, the occupation of the patient, the duration of his symptoms and the history of previous pulmonary disease. The recording of the history should be followed by a thorough and systematic physical examination of the chest. The method of such an examination is described in many text-books on physical diagnosis and will not be discussed by me at this time. I wish only to emphasize the importance of keeping an accurate record of all physical findings.

On completion of the physical examination, a microscopic examination of the sputum, when any is obtainable, should always be made for tubercle bacilli. The presence of bacilli makes the diagnosis of tuberculosis certain; the absence of bacilli in a case with physical findings suggestive of the disease should arouse the suspicion of the existence of some other chronic ailment, such as bronchus carcinoma, bronchiectasis, syphilis, actinomycosis, abscess, blastomycosis, lymphogranuloma, metastasis, etc. When a pleural exudate is present, aspiration is advisable, especially when large amounts of fluid are found and conceal the underlying pulmonary changes. Only after the withdrawal of the fluid is it possible in such cases to make a diagnosis even with the x-ray. Chemical and microscopic as well as bacteriologic study of the fluid may aid in making a correct diagnosis. A Wassermann test should be made in all doubtful cases of pulmonary disease.

Only after the above mentioned studies have been conducted should the x-ray examination be made. Too often the patient is sent to a roentgen technician who has little or no knowledge of pathology or clinical medicine, before a careful physical examination has been made. The result is that an incorrect diagnosis may be

reported and the clinician misled. There are chest diseases which cannot be diagnosed by x-ray examination alone, and this is especially true of certain forms of incipient tuberculosis. Several years of study in European clinics, where postmortem control was possible in all fatal cases, have convinced me of the danger of placing too much confidence in x-ray findings alone. The roentgenologist must co-operate with the clinician to obtain the highest possible percentage of correct diagnosis. And he is the best roentgenologist who has the broadest knowledge of medicine, especially of pathology.

After a careful history has been obtained, and the physical examination and x-ray study are completed, there still remain some special methods of investigation in certain difficult cases. These are pneumothorax, bronchography and thoracoscopy (Jacobaeus). An artificial pneumothorax may make possible the diagnosis of pleural metastasis, tumor of the chest wall, etc. The great value of bronchography, with the use of iodized oil injection into the bronchial tree, is now generally recognized in the diagnosis of bronchus carcinoma, syphilis of the trachea, bronchiectasis, etc. Thoracoscopy has a very limited usefulness in the diagnosis of pulmonary disease.

The study of a large number of cases of pulmonary and cardiac disease at the Wenckebach clinic of the University of Vienna during a period of four years has been of great value to me, chiefly because autopsies were performed on all fatal cases. The close cooperation of the internist, roentgenologist and pathologist creates a high standard of efficiency in diagnosis, and permits the internist and roentgenologist to profit by their mistakes as well as to establish new clinical pictures from time to time.

### BRONCHUS CARCINOMA

Bronchus carcinoma can no longer be considered a rare disease. In large European clinics, where autopsies are performed on all patients dying in the clinic, this disease has been recog-

\*Read at sixth annual meeting, American College of Physical Therapy, Chicago, Oct. 31, 1927.

nized for years. Today, with the aid of x-ray and bronchography and bronchoscopy, the diagnosis of a bronchus carcinoma offers no great difficulty in a high percentage of cases. It seems that this disease has increased throughout the civilized world in the past ten years. This increase is not alone due to better diagnosis, as the pathological institutes in which this condition has been recognized for years also register a marked increase in the number of cases. The fact that the disease usually begins with a metaplasia of the columnar epithelium to a squamous type speaks for the importance of chronic irritation as a predisposing cause. The importance of bronchus carcinoma can be realized from the statistics of Briese, who found 1289 cases of carcinoma in 12,971 autopsies. Of these carcinomas 60 were bronchus carcinoma, or 4.5%.

When a patient past middle life, who never had pulmonary disease, develops a dry cough, and expectorates a little blood-tinged sputum free from tubercle bacilli, one should think of the possibility of a bronchial cancer. The patient may for months present no other symptoms except perhaps a slight temperature and some loss in weight. In other cases hemoptysis, or cardiac symptoms with marked dyspnea, enlargement of the mediastinal glands, venous congestion of one side of the neck, face or arms, with edema may develop.

The diagnosis of bronchus carcinoma of the upper lobe is not so difficult by physical examination, but in the other lobes may be almost impossible without the aid of the x-ray and bronchography or bronchoscopy. Very often the condition is diagnosed as an indurative pneumonia or a fibroid tuberculosis. Any chronic pneumonia without a leukocytosis, without tubercle bacilli in the sputum, and with a negative Wassermann should arouse the suspicion of a bronchus carcinoma. When in a suspected pulmonary tuberculosis, no bacilli are found, one should always think of the following: bronchus carcinoma, bronchiectasis, syphilis, lymphogranuloma, or sarcoma.

I have classified the forms of bronchus carcinoma into five types: (1) *the lobar form*, usually looked upon as a chronic indurative pneumonia. In the lower lobe the diagnosis is often

very difficult; (2) *the pleural form*, characterized by an extensive hemorrhagic carcinomatous pleurisy due to involvement of the pleura; (3) *the bronchial form*, with bronchiectasis or bronchus stenosis, and atelectases; (4) *the mediastinal form* in which the metastases in the mediastinal glands, which are always present in bronchus carcinoma, dominate the clinical picture. This type may be very difficult to differentiate from lymphogranuloma, lymphosarcoma, hyperplastic tuberculosis, aneurysm of the aorta, etc. The primary tumor may be very small, but the mediastinal glands of tremendous size; (5) *the rheumatoid form* in which the bone metastases may give the first symptoms of an occult bronchus carcinoma. Here I wish also to include the two cases of toxic hyperplastic periostitis which I have seen associated with bronchus carcinoma.

Time will not permit me to discuss the symptoms in detail. But I wish to call attention to one complication of this disease which I have seen in five cases,\* and that is brain metastasis producing the symptoms of a brain tumor. The osseous system should always be carefully examined for metastasis. I have also seen three cases with metastasis in the adrenals. They may occur in any organ of the body.

#### SARCOMA OF THE LUNG

Primary sarcoma of the lung is a very rare disease, and cannot be diagnosed with certainty *in vivo*. I have seen three such cases. The first was characterized by a round shadow in the right upper lobe, which had no sharp boundary but gradually faded out into the lung tissue. The mass was separated for a considerable distance from the right hilum, in contrast to the bronchus carcinoma shadow which usually involves the hilum region. A second case produced a large, intense, sharply outlined shadow involving most of the left upper lobe, with paralysis of the left diaphragm. The third case resembled closely a pneumonic process of the right upper lobe, with enlargement of the right hilum. Only at autopsy can these cases be differentiated with certainty from other forms of malignant tumor.

#### HODGKIN'S DISEASE

I have seen in six cases of this disease large shadows in the lung fields, more or less sharply outlined, due to the development of areas of

lymphogranuloma in the lung itself. These may so closely resemble metastases that one of our cases was diagnosed as multiple sarcoma metastases. The autopsy revealed a lymphogranuloma primary in the lungs. Also in cases of generalized lymphogranuloma lung involvement is not at all rare. I saw in the Wenckebach clinic three cases of mediastinal lymphogranuloma in one family, all of the patients males. The cases are described in my publication in the American Journal of Medical Sciences for May, 1926.

The diagnosis of lymphogranuloma can be made with certainty only by histologic examination of a lymph node or the affected tissue. There are no specific blood changes. This disease is often erroneously classed with the blastomas. It is undoubtedly an infectious granuloma, as proven by the case of Dr. Priesel which I saw in Vienna, of a mother with lymphogranuloma who gave birth to a child suffering from the disease. The infection of the foetus was no doubt by way of the placenta.

The cardinal symptoms of Hodgkin's disease are: (1) glandular enlargement; (2) recurring attacks of fever; (3) polynuclear neutrophile leukocytosis with eosinophilia; (4) pruritis; (5) toxic symptoms; (6) enlargement of liver and spleen.

#### SYPHILIS OF THE LUNG

The diagnosis of syphilis of the lung is very difficult to make, and many cases so considered are probably not syphilis. The fact that a patient has a positive Wassermann does not yet prove that the lung shadow or cavity is a syphilitic lesion, any more than it proves that the gastric ulcer of such a patient is luetic. We must learn to distinguish between specific organic disease and non-specific disease in a syphilitic patient. I have seen two cases of syphilitic gummas of the lung, neither of which was diagnosed during life.

We may classify acquired syphilitic disease of the lung into (1) *gummatous*; (2) *gummatous-cavernous*; (3) *interstitial* with bronchiectasis; (4) *cirrhotic* form with scar formation in the bronchi and pleura, and (5) the very rare *pneumonic* form.

#### ECHINOCOCCUS CYST

Echinococcus cyst is rather rare in our country, but more frequent in Europe and quite common in certain countries of South America. I have seen ten cases of this disease. The finding of a spherical dulness in the axillary region should cause one to suspect echinococcus cyst. The diagnosis is usually very easy with the x-ray. A sharply outlined, spherical homogeneous shadow is characteristic. Calcification may occur in the wall of the cyst. Perforation of the cyst into a bronchus may be accompanied by a hemoptysis or the expectoration of a large amount of cyst contents with the membrane and hooklets. The cysts vary greatly in size, and may become large enough to occupy an entire lobe. Most of the cases I have seen were in the right lung. In one case there were also cysts in the liver and retroperitoneal tissue, which were visible in x-ray photographs due to calcification of the wall.

#### BRONCHIECTASIS

In patients with bronchiectasis, the characteristic history of the expectoration of mouthfuls of sputum, which forms three layers on settling, the odor of the sputum, the rales, and dulness in the phrenico-cardiac triangles enable one to suspect this condition. Fluoroscopic examination often reveals the dilated bronchi with their horizontal fluid levels. The injection of iodized oil makes the diagnosis certain, but I have not found this necessary in many cases. A careful fluoroscopic examination, with rotation of the patient, will make it possible to see the bronchiectasis. The chief causes of bronchiectasis are chronic bronchitis, pneumonia with induration, bronchial cancer, pleural scars and tuberculosis.

#### METASTATIC LUNG TUMORS

Any carcinoma or sarcoma in the body may produce pulmonary metastases, but there are certain malignant tumors which are characterized by their great tendency to produce lung metastases. These are all the highly malignant *sarcomas*, *hypernephroma*, *carcinoma of the breast*, *chorio-epithelioma*, *ovarian carcinoma*, *malignant teratomas*, etc. I have seen lung metastases in two cases of larynx carcinoma, and



in four cases of stomach cancer, also in two cases of pancreas carcinoma.

Small metastases may produce no clinical symptoms whatever. Here the x-ray is the only means of diagnosis. It must be remembered, however, that tuberculosis and also lymphogranuloma may produce solitary sharply outlined shadows in the lung resembling tumor metastases or benign tumors.

Numerous metastases may produce the clinical picture of a bronchopneumonia. I have seen several cases of miliary carcinosis mistaken roentgenologically for miliary tuberculosis. Two cases of melanosisarcoma with multiple minute metastases in the lungs were so diagnosed. Other sarcomas, also chorio-epithelioma may produce a similar picture. Extension to the pleura with hemorrhagic exudation may cause a darkening of an entire lung field. This I have already described as frequent in bronchus carcinoma, and it also occurs in pleura endothelioma, (carcinoma).

I wish finally to call attention to the fact that lung or pleura metastases may develop years after operation for sarcoma or carcinoma, at a time when the patient is considered cured. I saw a case of melanosisarcoma of the eye with pulmonary metastases twelve years after removal of the eye. I saw another case of a woman who died of lung and pleura metastases six years after operation for carcinoma of the breast.

#### LUNG ABSCESS

Abscess of the lung may be: (1) *bronchopneumonic*; (2) *embolic*; (3) *metastatic*; (4) *bronchiectatic*. The bronchopneumonia form is seen frequently in influenza, aspiration bronchopneumonia with mixed infection with spirochetes, etc. The only difference between such a lung abscess and gangrene is in the bacterial flora. In the latter putrefactive bacteria as well as pyogenic forms are present.

The embolic form of lung abscess usually follows a septic thrombosis, just as does pyemia of septicemia in general. It is seen after operation when a septic thrombus forms in a vein. Emboli of bacteria are then carried to the lung where they set up an abscess formation.

A metastatic tumor form of lung abscess occurs when tumor metastases develop and these

contain bacteria which cause them to break down with abscess formation. I have seen two cases of larynx carcinoma with multiple lung metastases, some of which formed abscesses in the center with a horizontal fluid level. Either the bacteria were brought to the lung with the tumor emboli, or the tumor growths in the lung were invaded by bacteria from the lung or blood stream.

Bronchiectatic lung abscess is not uncommon and is also due to the formation of areas of bronchopneumonia about the infected bronchi with subsequent abscess formation.

I wish to call attention to still another form of lung abscess which I have observed in patients with cardiac decompensation. Such patients with passive congestion of the lungs frequently develop hemorrhagic lung infarcts. In the absence of an endocarditis these are due to the breaking loose of fragments of aseptic thrombi formed in the right ventricle or in the auricular appendage or in the veins of the extremities. The aseptic infarct may become infected with bacteria present in the lung and undergo suppuration with abscess formation. The patient may then succumb to the lung abscess or empyema if the cardiac condition improves.

#### MEDIASTINAL TUMORS

The subject of mediastinal tumors, in the broad sense of the term, is such a large one that I shall reserve it for discussion at another time. I wish here only to enumerate the most important causes of mediastinal tumor formation. They are: (1) tuberculosis of the mediastinal lymph nodes especially in the primary complex in children; (2) acute lymphadenitis in acute infectious diseases, (3) syphilitic gummas; (4) lymphogranuloma; (5) lymphosarcoma; (6) teratomas (dermoids); (7) aortic aneurysm; (8) substernal thyroid; (9) esophagus carcinoma; (10) dilated esophagus due to cardiospasm; (11) cold abscess due to Pott's disease; (12) persistent thymus; (13) sympatheticoblastoma, etc. The possibility of a bronchus carcinoma with mediastinal tumor due to metastasis in the lymph nodes should always be kept in mind. I have already discussed this under the subject of bronchus carcinoma.

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## THE VALUE OF PHYSICAL THERAPY IN INTERNAL MEDICAL DISEASES\*

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The value of any therapeutic measure depends upon the intelligence used in its selection and application. It has been said that everything has some therapeutic value, its efficacy being dependent upon its manner of administration. If this is true, then a knowledge of the physiological action of any therapeutic measure, and its effects upon the normal organism as well as upon any functional or pathological deviation from the normal is absolutely essential. It is assumed that the physician has a profound understanding of pathology and diagnosis.

X-ray therapy is gradually becoming more and more useful to the physician practicing internal medicine. Quite recently our attention was called to its use in the treatment of acute endocarditis. The relief of this disease is based upon the same reasoning as that for the treatment of boils, carbuncles, and several infectious conditions which yield quite readily to the x-ray such as pertussis, erysipelas, acute bronchitis, sinusitis and tonsillitis.

In hyperthyroidism the beneficial effects of roentgen rays have been firmly established and at this time in England most exophthalmic goitre patients are being so treated in preference to surgery. A few years ago the physician looked upon Grave's diseases as his particular field and was quite incensed when the surgeon marked the patient with thyrotoxicosis for his own. Now the physician may again invade that field by means of roentgentherapy. This method of therapy is particularly applicable in patients who are timid concerning operation or who must work for a living and to whom hospitalization would be a real temporary handicap. These patients may be completely relieved while going about their usual vocations. X-ray therapy may also be used to tide a patient over a rough period until surgery may be conveniently risked.

Among other things of interest to the physician and indicated for roentgentherapy are

spleno-myelogenous leukemia, deep seated adenopathies, tuberculous lesions of bones and glands, phlegmon, unresolved pneumonia, chronic bronchitis, some types of asthma and a number of other manifestations dependent upon chronic infections. In inoperable carcinoma, roentgentherapy will do two things that no other agency or agencies in medicine will do; it will relieve the pain and prolong the life of the patient. If x-ray therapy has been productive of no other achievement it has justified its existence.

A similar tribute might be made to diathermy in the treatment of lobar pneumonia. I have attempted, in a previous paper, to show the effect of diathermy in lobar pneumonia from a physiological standpoint and attempted to explain its action in the relief of pain, cyanosis, dyspnoea and fever. Since that time one of my colleagues has studied two hundred cases of lobar pneumonia treated with and without diathermy. He reports a fifty per cent shorter convalescence, no empyemas, no cardiac failures and no complications in those treated within the first forty-eight hours of the disease by diathermy.

The liver and the diseases which are peculiar to it are greatly benefited by diathermy, and recognition will soon be accorded it in relation to these maladies. In postoperative shock, especially after cholecystectomy, and in acute depression from any cause, diathermy raises the body temperature. Crile says that "diathermy to the liver, by raising the body temperature one or two degrees, increases the internal respiration on which life itself depends." Diathermy is certainly indicated in acute catarrhal jaundice. In a recent epidemic, those patients so treated became convalescent in about one third the time required by the patients not so treated. Martin calls our attention to the treatment of the liver and heart when the congestion of the former is due to or causes disease in the latter. He treats either or both organs. Treatment of the heart itself is done by many physical therapists

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for several conditions and there is no more gratifying relief to any patient than that obtained by diathermy in angina pectoris.

Lying fairly close to these organs and intimately connected with them both in health and disease are the kidneys. Acute and chronic inflammation of these organs may be treated without hesitation with diathermy. Such treatment of these organs must not supplant the usual regimen but must be used as an adjuvant. Renal calculi with hydrops and hemorrhage are not a contra-indication to diathermy, since many reports have been made of stones that have passed more readily as a result of the relaxation that diathermy affords. Cystitis is another disease in which diathermy is indicated.

Without a doubt ultraviolet radiation stands pre-eminent among the physical therapeutic agencies that are of value to the physician. Its physiological action includes many effects not obtained by drugs, applications or diets. Most important among them are: the synergistic action to iron, arsenic, calcium, phosphorus and iodine; the assistance it renders to the metabolism of certain substances; its bactericidal effect; its stimulation of connective tissue formation; its relief of congestion; its stimulation to phagocytosis and diapedesis of leukocytes; its influence in increasing the coagulation of the blood; its regulation of the secretions from the endocrine glands and its similarity to their action. Lorand has recently called attention to the synergistic action of ultraviolet radiation when given with iron or iodine. He says that what codliver oil is to the child, iodine is to the adult and cites many instances as proof of the fact that both work better when exhibited with ultraviolet radiation. He speaks emphatically of the stimulating effect of these rays on the entire group of endocrine glands and says that ultraviolet light has the same effect as the combined harmonious action of the entire group. He believes that if any of these glands are deficient ultraviolet light stimulates its function and also depresses any gland or group of glands that has a tendency to be over active.

Focal infections are still an interesting subject and the problems which they present are hard to solve. General ultraviolet radiation is

indicated regardless of the source of the infection since the resistance of the patient to the infection is increased by its use. Its beneficial effects are often so prompt that the patient is practically well by the time the infection is located. Deep seated lesions do not contra-indicate its use since its effects are by no means superficial.

The ultraviolet ray is so called from its position in relation to the solar spectrum and is referred to as the actinic ray because of its ability to do chemical work. The activation of cholesterol, the ability to increase red blood cells, the stabilization of calcium and phosphorus metabolism and the energizing of vitamins are proven facts—the result of experiments. Keyting has recently confirmed the claim of European investigators in the field of syphilis that a Wassermann fast blood may be converted into a negative blood through exposure to the ultraviolet ray while under treatment.

Countless numbers of fleshy people are looking for a real relief from their overweight. In the treatment of obesity with ultraviolet ray much good may be accomplished but our sole dependence must not be put upon the light. The patient must diet. The quantity of food taken is more important than the quality. Restrictions in diet for the obese are necessary but these restrictions should be largely a matter of amount and the restricted diet should not contain too many proteins. Starches and sweets may be eaten without increasing the weight if meat is restricted and the diet is largely vegetable.

Ulcerations of the gastro-intestinal tract have been largely overlooked by the physical therapists, yet these patients respond very nicely to ultraviolet radiation. Recent hemorrhage is the only contra-indication to its use. If hemorrhage has occurred, ultraviolet radiation may be started cautiously within two or three days after the bleeding stops. The action of ultraviolet light in these cases, as pointed out by Quincke is an acceleration of the leukocytes. In addition to this, there is relief of the congestion around the ulceration and a rapid increase in connective tissue production within it.

Almost every article on ultraviolet radiation has something to say about the treatment of

pulmonary tuberculosis. Either too much has been said or too little as there is yet no regular standard of treatment or any definite agreement among physicians as to just what types of cases are best suited to its use. Certainly profuse hemorrhage and high temperature should be "stop signs" for the treatment. All other cases should be treated but they should be treated intelligently. The tendency is to be too generous, following the old lady's dictum that "if a little is good, more is better." Daily treatments in pulmonary tuberculosis are too often. Three times a week with an extra rest day on Sunday is about right. This allows time for the slightly debilitating reaction of one treatment to wear away before the next one is given. It does not cause uncomfortable erythema and it does allow for slower, more healthful tanning, thereby permitting a protracted series of treatments.

Chronic bronchitis and the so-called "pre-tuberculous" condition in children are distinct indications for ultraviolet therapy. As pointed out by Perlman, these are conditions in which drugs do no good. The ultraviolet treatment should be supplemented by good food, fresh air, rest and plenty of water. In older people, chronic bronchitis has usually been present for a number of years and is accompanied by more or less emphysema and bronchiectasis. In these cases the ultraviolet treatment may be supplemented by x-ray therapy, diathermy or both.

Unresolved pneumonia and interstitial pneumonitis respond very well to a combined treatment of diathermy and ultraviolet radiation. Either of these conditions may resemble pulmonary tuberculosis and it is important that the diagnosis be clearly established.

Much has been written about the effect of ultraviolet light on metabolism. It is surprising

to note that a distinct difference has not been stressed between its effect on the metabolism of certain chemicals and foods and its effect upon the general basal metabolic rate. This lack of distinction has led to the erroneous supposition that ultraviolet radiation is contra-indicated, and under no circumstances should be given in exophthalmic goitre. Mason and Mason report the study of ten cases with this in view and found that in no case was the basal metabolic rate increased but that in all cases it was decreased with a slowing of the pulse rate. Similar results from natural and artificial ultraviolet radiation are also reported by Lorand.

Not all the different types of physical therapy have been mentioned nor has it been possible even to catalog the variety of diseases in which physical therapy is beneficial. A most careful consideration of the effects of physical agents will lead us to make new indications with the material we have at hand. Scientific study will continue to reveal biological effects that we have observed but have failed to properly interpret and apply. It must not be expected that physical therapeutical agents will work miraculous cures either singly or as adjuvants to the usual measures taken to relieve the patient. But their adaptability to certain pathological states and abnormal conditions render them extremely serviceable to the physician.

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## THE RELATIONSHIP OF PHYSICAL THERAPY TO DERMATOLOGY

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About the first experimentations that have been made in physical therapy were made upon the skin. Early, man started experimenting and he is still doing it, but while experiments have been made we have found many definite things that can be used in skin disease. This relationship has brought about an intimacy so that the modern dermatologist's office and his hospital ward contain nearly every piece of apparatus that is known to modern medicine.

A few years ago we heard a great deal about specifics, and about our seeking for panaceas. Panaceas have been given up because there is no one thing that will cure everything and as has been aptly remarked, the specialist is one who is learning more and more about less and less, but as a matter of fact, the specialist is learning more and more about physical therapy.

The research, of course, is dependent upon men who are interested in this particular field and so the relationship, the field that the skin affords, has brought about a larger field I should say, than any other in medicine.

We must not forget that the skin is more than a covering for the body; it is an organ essential to life, and we all know that just in proportion as the skin is destroyed either by injury or disease depends the health of the individual. A certain area of the skin destroyed means inevitable death. There is no way to save the patient, and just in proportion with the destruction do we find the health of the individual concerned.

The skin is an organ. We must not forget that. It has an anatomy, it has a pathology; it has great possibilities in physiology, and it has great possibilities in pathology. The skin is the only barrier between the patient and the whole world; therefore, the skin is liable to almost any injury and almost any disease. What a wonderful field this is for physical therapy.

I am not going into details concerning the particular pieces of apparatus nor their uses, because we are talking from one standpoint or another in a symposium. Other men who follow me will take up various phases of physical therapy and go into them more deeply, but I want to bring to your attention the fact that the skin is perhaps the largest field for physical therapy today.

It is peculiarly adaptable to all sorts of physical apparatus. You must remember in using various forms of physical therapy that you make most of your applications on the skin or the skin is the medium through which your treatments are given. It is almost impossible to make an application to the body without using the skin in one form or another as a medium.

We use galvanism, x-ray, radium, ultra-violet, and infra-red in therapy. We use all forms of diathermy, surgical as well, and it in this field that we are going to try to tell you something today.

The lesions of the skin that are particularly adaptable to the use of physical therapy are very large in number. The general or universal eruptions due to systemic manifestations, of course, call for larger applications in greater areas. The systemic involvement is always manifest by the fact that the lesions are bilateral instead of unilateral, and it is in this point that I wish to make a differentiation particularly in those newer lesions of the skin.

So many skin diseases are observed after the patient has suffered for years and the lesions are characteristically placed topographically. Anyone can make a diagnosis usually after a number of years of existence, but the new lesion that appears on the skin is always a problem. This may help many of you in the treatment of skin diseases by physical methods, for the reason that it wouldn't be quite so well for you to desiccate a few small lesions of eczema, or psoriasis, and later find you were

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dealing with one of these diseases instead of a possible epithelioma. Be careful of your early lesions.

The relationship between treating the skin and the entire body depends greatly upon the fact that many of the things that are now known about changes taking place in the human body, due to applications of various forms of physical therapy, were first determined rather accidentally. The use of lights, for instance, and of rays,

x-rays, and radium were found through working upon the skin; the deeper therapies of all types, the use of diathermy in its various forms, have all been determined through the first experiments upon the skin and by persevering. In further research we have found that there were certain deeper effects upon the body as a whole. So our field of dermatology has contributed a great deal toward the field of physical therapy and in helping to bring about many of the results that we find in the general economy.

## ULTRAVIOLET IN THE TREATMENT OF DENTAL PATHOLOGY\*

H. G. FRANKEL, D.D.S.  
ST. LOUIS

When one considers the biophysics and the therapeutic effects of ultraviolet, one can hardly realize why there are not more physicians and dentists using the mercury quartz lamp.

If the theories of such men as Bovie of Harvard, Steenbock of Wisconsin, and Hess of Columbia are of any consequence; if the statements by these eminent authorities as to the germicidal effect of the chemical ray of light upon living tissue are correct; if the theory as to the action of ultraviolet upon the system, in reference to the stabilizing and fixing of the calcium and phosphoric content of the blood are correct and lastly, if such an eminent dental scientist as Weston A. Price, has found a definite action of light and calcium metabolism on the production of dental caries, then why shouldn't every physician and dentist be using this means to decrease the spread of dental infection in this country.

I have in a brief way summarized some of the dental ailments that the average practitioner sees in his daily work. To this, I have added some of the diseases that the dental specialist treats and then to give you an insight into the therapeutic aspect of this situation, I shall go into the advantages of the use of light in connection with your routine treatment.

In the first place, where is ultraviolet

specifically indicated in dental surgery? I would say that it is indicated in all cases of dental caries, all infections of teeth and gums, these include, gingivitis, all types of ulcers, cellulitis, periostitis, Vincent's angina, acute alveolar abscess, all inflammations of the peridental membrane, neuralgia, pyorrhea, postoperative pain, postoperative infection, orthodontia, and faulty development of body tissue due to lack of calcium.

Why is ultraviolet indicated in dental caries? May I quote from a paper by Dr. Weston A. Price, Cleveland, Ohio, Director of Dental Research, American Dental Association? Dr. Price states, "that certain blood calcium factors are influenced by activators, which may be applied either through the stomach or externally to the surface of the body. In the former, they may be related directly to the utilization of the calcium from the food. When applied externally, they must act on the food by first acting on the circulatory fluids of the body. The evidence strongly indicates that the marked susceptibility to dental caries of both childhood and motherhood is in part due to a state of stress in which the subjects are in a condition of negative calcium balance and the correction can be improved by administration of small quantities of activated oils or tonic radiations of ultraviolet."

Therefore, as about 85% of dental pathology is carious in nature, it seems only rational

\*Read at physical therapy meeting, Kansas City, Mo., Aug. 31, 1927.

that ultraviolet is indicated in practically every case that presents itself to the dental surgeon.

The next most important field, from the standpoint of the dental specialist and the general practitioner is the use of ultraviolet in the treatment of infections. There are many who still are of the opinion that there is no truth in the statement that ultraviolet is a germicide and a sterilizing agent, and they scoff at the idea of penetrating effect of light. To these and to many others who may have their doubts, I want to quote from articles by Dr. Howell and Dr. Bovie on the germicidal effect of ultraviolet.

"Ultraviolet is a germicide. It is responsible for the purification of the air we breathe and the water we drink. Ultraviolet kills bacteria." Bovie found that ultraviolet of wave lengths of 2925 Au or shorter killed bacteria and spores in ten minutes. He also found that ultraviolet can penetrate blood filled tissue to the depth of a fraction of a millimeter, but by compressing the tissue, ultraviolet killed bacteria through four millimeters of tissue. The bactericidal action is both direct and indirect and penetration is not necessary, due to the fact that even a small chemical action will, by catalytic action, have a far reaching effect on the entire system. Thus the destruction of buried organisms is accomplished by the indirect activities of the ray. Ultraviolet aids in the production of antibodies and the rays are absorbed and carried by blood and lymph channels, thus increasing the phagocytic property of the blood. This being true, we then shall take up some of the infections of oral origin and discuss each fully.

*Gingivitis.* While this condition may or may not be pathogenic, it is by far the most common disease next to caries that the dentist or physician sees. The pathology of this disease consists of spongy, inflamed gums, sometimes even of a purplish hue, profuse bleeding at the slightest touch. If pathogenic bacteria are present, you will usually find staphylococci or streptococci, preferably the former. The teeth usually have a film of mucous and in most cases you will find calculus. The calculus being of the hard variety, though it is not uncommon to find serumnal calculus in this condition. The treatment of these cases is to first clean the teeth,

scale them and then with a dental speculum, give the gums anterior and posterior, a regenerative erythema of ultraviolet light. The distance being two inches from the gums and the time about one half minute. One or two treatments usually suffice.

*Periostitis.* This is the inflammation of the peridental membrane and is caused, usually, by a traumatic injury to the vascular membrane that supports the tooth in its socket. It resembles gingivitis to a great extent, the only difference being that it is usually confined to one or more teeth and is usually not associated with pus formation. The treatment is practically the same as that of gingivitis, though in most localized cases a quartz rod is used either in contact or under compression, a regenerative erythema being given. Care should be taken not to blister.

*Vincent's Angina.* This is commonly known as trench mouth. It was quite prevalent during the war and has been quite a problem to the dental practitioner since. It starts in small patches at the gingival margins of the gums, spreads rapidly and if not checked, involves all of the gums, cheeks, even lips and tonsils. It is pathogenic in origin and is caused usually by the bacillus fusiformis and spirocheta vincenti. The gums take on a grayish white hue, and there is generally a definite line of demarcation between the diseased tissue and the healthy tissue. The diseased tissue comes off in shreds or patches, leaving open, ulcerated sores. It is very painful and the patient suffers greatly from Vincent's disease. Its cause is usually due to two factors, filth, due to lack of care of the mouth, or infection from outside sources. You will find that in most of these cases the seat of infection will be in the tonsils.

In treating these cases, care must be taken not to give the patient an overdose of light. The entire mouth should be rayed, giving a little more than a stimulative erythema, using a dental speculum and raying the gums anterior and posterior, and also the tonsils, and posterior wall of the pharynx. This is indeed important as you may clear up the gums and still have your infection in the throat, with a great possibility of reinfection.

Some cases of Vincent's will clean up after two or three exposures with light, but there are some stubborn cases that require twenty or more exposures. Ultraviolet will in practically every case clean up Vincent's angina and I would say that it is practically a specific in this disease.

*Pyorrhea Alveolaris.* There have been so many cures, remedies and theories advanced for the cure of pyorrhea that one is really afraid to claim anything for fear that he will be considered in the same class with the many who have fallen by the wayside in their attempts to conquer the mystery disease of dentistry. Like cancer, pyorrhea has baffled the ages, and the more we have strived to penetrate the cause, and to find the remedy, the farther away have we gotten from the solution, and today, if you should ask your dentist, what he can do in pyorrhea, he will shrug his shoulders, and tell you to have the offending teeth removed. Now, pyorrhea is a very interesting disease and it attacks all classes and even the patient, who is most precise and conscientious in his dental hygiene, sometimes finds that he is one of the "four out of five" as a tooth paste concern so aptly expresses it.

What is the cause of this disease? No one seems to know. Bass and Johns claimed that it was caused by the amoeba buccalis, a certain micro-organism that they found in cultures of pyorrhetic pockets, but it was later proven that pyorrhea occurred when the amoeba was not present and even though you did kill this germ the disease continued. Cultures of pyorrhea pockets show all types of micro-organisms and up to date, all effort to isolate a specific organism have failed.

As to the pathology, the gums recede, become flabby, spongy, and usually very inflamed. The histological picture shows a destruction of the alveolar process, and a very definite line of demarcation of the invasion of the disease into the cellular structure of the bone. The teeth become loose, the periodontal membrane surrounding the tooth is absorbed and there is breaking down of the surrounding tissues. The peculiar part of the disease is, that though all of the surrounding tissues are broken down, the disease rarely affects the tooth structure itself, and there are very little changes in

the cementum and enamel, or in the vascular organs supplying the tooth itself. This is indeed something that is queer and makes one wonder whether pyorrhea is really caused by micro-organisms or is a disease caused by the lowered resistance of the body. With these thoughts in mind, let us consider another phase which enters into this condition. We have been told that alveolar process, once destroyed, never can be regenerated. Is this really true? Dr. Hugh McMillan has definitely proven that new bone or alveolar process can be regenerated due to change of stress and he has cited a great many cases to prove his point. We know that bone can be regenerated in any other part of the body, as long as the periosteum is not destroyed. Dr. McMillan shows that the histological picture of the jaw has the same cellular structure that we find in other bones and he has shown that the alveolar process does contain Haversian systems, thus exploding another theory of years ago. Now, if we can regenerate bone by the change of stress, is it not practical to surmise that we can stimulate the growth of bone by the action of a chemical ray which has been proven to aid in the growth of bone elsewhere in the body. Is it not also possible that our bactericidal action will act as well on the germ causing pyorrhea as it would on any other pathogenic organism. I am not claiming a cure for pyorrhea but I do believe that ultraviolet comes closer in solving the treatment of this mysterious disease than any other method that we have at the present time.

McCullom stated that in pyorrhea there is a certain deficiency that could be corrected by diet. I surmise that this deficiency is either a calcium or phosphorus one or both, and as ultraviolet has a definite effect upon calcium and phosphorus metabolism, all patients suffering from pyorrhea should by all means receive general body radiations of ultraviolet light. This should be routine. The teeth should be scaled and polished and then ultraviolet light should be applied to the tooth, by use of a water cooled lamp, and a quartz rod applicator at six different points. The apex, (anterior and posterior and the mesial and distal gingival margins, anterior and posterior), should be rayed. Not more than five teeth should be treated at one time. There are two technics for the treatment

of pyorrhea. The first is that laid down by Dr. Sampson in which he treats each tooth as described above only he gives a two to three minute radiation to each point, thus producing a severe reaction, even a blister. The second method, and the one that I like the best, is to start with one-half minute exposures over the six areas and increase the time one half minute with each treatment. In this way you gradually build up a resistance in the mucous membrane and when you finally get up to the massive dosages, you can give them without fear of putting your patient to a great deal of suffering and discomfort. The action in both methods is the same, and the end results are the same, as the primary object is to get the ultraviolet into the tissues and renew alveolar process. I have seen teeth quite loose, tighten up by this method. Remember this, if over two thirds of your alveolar process is destroyed and your periodontal membrane is practically gone, the case is hopeless. Do not expect that the alveolar process will be regenerated to the point of normal, nor the gum tissues restored, but you can save quite a few teeth that otherwise would have to be extracted, by this method.

*Alveolar Abscess.* Ultraviolet will aid more in the treatment of acute alveolar abscess than any drug I know. We know that ultraviolet is a germicide and that it has analgesic properties, and it acts in these capacities in the treating of alveolar abscess. Please do not misunderstand me, as I am not claiming that you can cure an alveolar abscess without first removing the cause. The cause, as you know, is usually a putrescent pulp or the infection of a root canal. These must be drained and sterilized and then we use ultraviolet for palliation. The time of the treatment is from one half minute to one

minute, with a quartz applicator in contact or compression according to the amount of soreness present. One or two treatments will usually reduce the swelling, and treatments are continued for several weeks or a month after the canal or canals have been filled. If you have a denuded or exostosed root, all you can expect is a palliative result.

*Orthodontia.* Where is ultraviolet indicated in orthodontia? Orthodontia deals not only with faulty occlusion, but with faulty development and faulty calcium and phosphorus metabolism as well. I feel sure that you will all agree that where you have slow development of teeth you usually have under-developed bones and sometimes under-developed organs. Hess says that 90% of the new born are suffering with rickets, and that, as you know, means a lack of calcium. Knowing this, then isn't it perfectly natural to assume that the tooth buds, which are basically formed by calcium and phosphorus should be involved in our process of development? Only when the orthodontist realizes that by the use of ultraviolet can he increase the calcium and phosphorus content in the child, thereby aiding in his general development, then will he have a much easier time in his work. Case records of hundreds of patients prove that growth following exposure to ultraviolet has been almost phenomenal and this growth does not only affect the limbs but has a definite effect on the entire body.

In conclusion, I wish to state that ultraviolet is as valuable in dentistry as it is in medicine and the sooner the physician and dentist realize this fact, the better equipped they will be to give the most efficient service to suffering humanity.



## THE GRAPH IN X-RAY DOSAGE COMPUTATION\*

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While the graph is employed constantly in recording experimental or other data, it can be of practical use to the radiation therapist. Its value is not limited to x-ray, but may be adapted to radium or other forms of physical therapy where intensity,\* distance, and time bear certain relations to each other.

The graph should be as much a part of a particular radiation apparatus as its rheostat or switch. It is a safety device to a physician with a single apparatus, as well as to the hospital with multiple radiation units. It is a fact and generally conceded that x-ray machines vary considerably in their energy output. These facts should not be committed to memory because the potentiality of x-rays does not permit errors, especially those preventable.

X-ray therapy, is, as a rule, administered by the physician or under his direct supervision. Watching the kilovolt and milliamperemeters is usually delegated to a nurse or assistant who must observe that the output of radiation remains constant. The task of subsequently recording the administered dose also falls upon the nurse, who is, as a rule, wanting in radiation mathematics. The physician must, therefore, compute for each exposure given, and may, when in haste, record erroneous conclusions.

Figure 1 represents a graph made of the computed and biologically proven results with a Kelley-Koett high voltage apparatus. The ordinates and abscissas represent the time and distance respectively. This arrangement may be varied according to one's preference. It is obvious that plotting must be done for each individual machine, and either time or distance may be read by interpolating.

By mathematically checking the accuracy of the factors during the plotting, the well-known physical laws of radiation-effects are constantly kept in mind; viz. intensity varies directly as the milliamperage; intensity varies directly as the square of the kilovoltage; intensity varies inversely as the square of the distance.

The outstanding features of the graph are, therefore: The ease of reading at a glance the cardinal points comprising the formula for therapy; the nurse's ability of checking the accuracy of the formula for every patient; it is a permanent record of the capacity of any form of radiation modality.

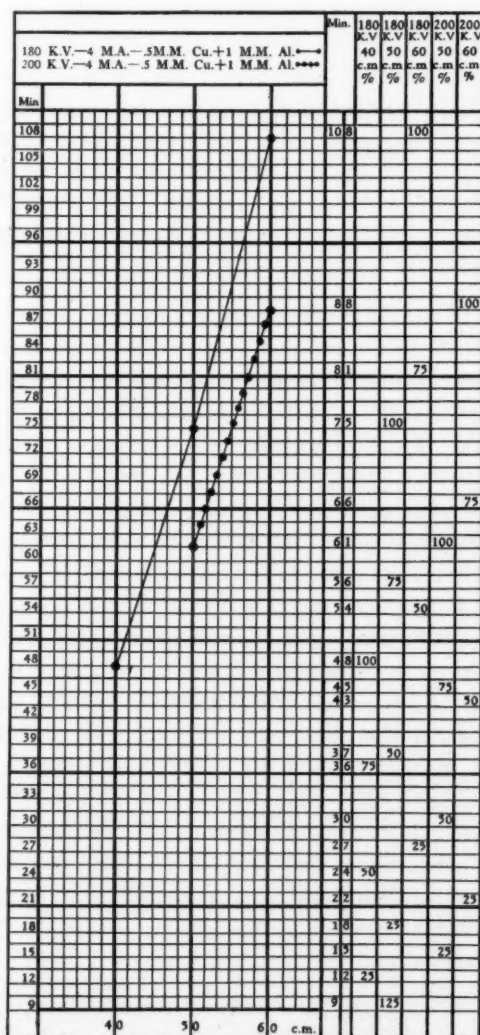


Fig. 1. Graph showing the time in minutes and the distance in centimeters.

At the right—Percentage of erythema dose administered is plotted for various heights, time, and kilovoltage in common use.

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# PHYSICAL THERAPY CLINICS

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## CHRONIC RHINITIS

FROM THE CLINIC OF DR. A. R. HOLLENDER,  
CHICAGO EYE, EAR, NOSE AND THROAT HOSPITAL  
CHICAGO, ILLINOIS

One of the frequently observed conditions is that of simple chronic rhinitis. The most prominent symptoms are obstruction and so-called "catarrh." Vague as this term is even to the physician, it implies a state of inflammatory change with secretion and difficulty in breathing. Certain factors such as the weather, food, temperament and physical status of the individual play a part, but even if these are corrected local treatment cannot be avoided.

It is well to summarize the numerous measures which have from time to time been suggested. Relief is afforded the patient by means of astringents. These have a shrinking action on the membranes, and, temporarily, at least, the patient is improved. Some of these solutions such as epinephrin and cocain, or combinations of them are commonly employed in the course of routine office treatment. Occasionally, too, their use is advised for home care. Their secondary effects are, in most instances, so distressing as to warrant interdiction of their use for relief purposes. Nasal washes, antiseptic drops, such as some of the more recently advanced silver and mercurial derivatives, offer little in the way of favorable action. For the intumescence of the inferior turbinates, either the chemical or actual cautery has been advised, but only in a small percentage of patients, have the results been successful and of long duration.

As a result of this dissatisfaction, surgery has been frequently resorted to, but probably more so than indications warranted. Even after surgical intervention, the nasal membranes do not always change their characteristics. The thickening persists and hypertrophy ensues.

The symptoms become aggravated and if the pathological process continues, polypoid changes in the tissues occur. This state calls for surgery as nothing short of this will produce a good result and restore normal function.

In simple chronic rhinitis and in less advanced cases of hypertrophic rhinitis, zinc ionization has been found to be an effective remedial measure.

This patient, a male, age 36, presents himself with a complaint of difficult breathing and profuse thick secretions. The condition is of two years' duration. Blowing the nose is an extreme effort and aggravates the symptoms. Some postnasal dripping is present. The accessory sinuses have been examined by transillumination and roentgenograms and appear to be negative. The inferior turbinates are markedly congested and enlarged. Some secretions are seen on the floor of the nose on the right side. Examination of the pharynx and postnasal space shows these to be injected with a slight coating of mucopurulent secretion on the posterior wall.

It is highly probable that some of the usual methods of treatment, carefully and rigidly carried out, would improve this nasal condition. From my experience with a large number of these cases, I am not going to recommend such measures, because I favor zinc ionization. I shall treat the right side of the nose first. I wipe the membranes gently with cotton applicators in order to cleanse them. I use no cocain or other drug solutions. I pack the nasal chamber with long narrow strips of gauze which are made wet in a weak solution of zinc sulphate

( $\frac{1}{2}$  to 1 per cent). I take a fine flexible copper wire and fix one end into this wet packing. The other end of the wire is connected to the positive pole of the galvanic apparatus. The negative electrode, a wet pad about four by five, is now fixed on the patient's forearm and a wire from it connected to the negative pole of the apparatus. Some dry cotton is placed against the wet packing in the nostril in order to prevent dripping and unnecessary conveyance of the current along the stream of the excess solution. I turn on the current gradually, increasing it to 8 or 10 ma. The current having been on for ten minutes, it is slowly discontinued and the switch cut off. The wire which was inserted into the wet packing is extracted and the cotton around it is examined. Note the bluish stain of zinc, a true chemical change having taken place. The remainder of the wet pack is now removed and the nasal space inspected. The membrane is grayish in appearance. The turbinates have been depressed temporarily by the packing and do not return to their former position. There seems to be evidence of contraction of the inferior turbinate. This procedure is known as intranasal zinc ionization.

It has been employed in England in cases of hay fever and the idea originated with its use in this affection. Zinc ionization has been used by Friel and others in chronic purulent otitis media. His results in selected cases have been good. In this country, several otologists are now using zinc ionization in certain cases of chronic otorrhea with gratifying results. The use of galvanism in the nose is an old method which is described in many of the older texts. The technic was basically the same as the one described except that needles were inserted into the inferior turbinal bodies. The changed technic makes the procedure more desirable. It

is simpler. The ionizing action of the zinc salt is definitely astringent, but without ill effects. On the contrary, the action on the membrane is a favorable one. Friel states that zinc ionization has an antiseptic action. If this is true in the ear, it is probably also true in the nose.

This patient will experience no pain, but may have a slight reaction in that the intranasal breathing is made more difficult for a day or two. After that, these secondary symptoms as well as the original ones, will be less severe. In four to five days a definite improvement will be felt. Breathing is easier and the discharge greatly lessened. If after one week some indications still exist, ionization in the same side of the nose will be repeated. Otherwise the other nasal chamber will be treated.

This method is ideal for children. It can be carried out with little difficulty in patients who have definite indications for operation, but in whom substantial treatment for temporizing purposes is necessary.

The results in several hundred cases during the past four years have been uniformly good. It must be remembered that proper selection of cases is important as is due attention to general measures which very often aid in the correction of chronic rhinitis. As a local remedy for this affection and the less advanced cases of hypertrophic rhinitis it has given every indication of possessing greater merit than any other non-surgical therapy known at the present time.

This patient who was treated is told to return in two days and a careful inspection of the nose will be made at that time and at like intervals afterward. All other local treatment is suspended during this observation.

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# EDITORIAL

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## ARCHIVES OF PHYSICAL THERAPY, X-RAY, RADIUM

### SECOND INTERNATIONAL CONGRESS OF RADIOLOGY

The Second International Congress of Radiology, to which the executive committee of the American College of Physical Therapy kindly delegated me as representative, was held in Stockholm July 23 to 27, inclusive. This congress followed the First International Congress held three years ago in London, at which Dr. Kobak and I did what we could to represent American physical therapy. In the organization of the congress this year, the Swedish committee left nothing to be desired. It was a dignified, orderly and scholarly gathering of scientists of international reputation.

The scientific sessions were held in the Houses of Parliament, and both of the large parliamentary chambers were used, as well as four smaller meeting rooms. The official opening of the congress was held in the very beautiful Concert House in Stockholm, which is an exceptionally artistic structure, marvelously illuminated by indirect lighting, and so efficiently that photographers had no trouble taking pictures during the ceremonies.

The banquet, given to the members of the congress by the city of Stockholm on the evening of Wednesday, July 25th, was a most memorable event. It was held in the Gilded Room of the city hall, a building considered to be the most beautiful, modern structure in the world. The delegates to the congress and their ladies were received in the Blue Room, an architecture of Venetian design whose ceiling is over 100 feet from the floor. All of the light into this vast room enters from windows close to the ceiling. From this room there is a staircase leading to the Gilded Room, which is large enough to seat over 800 people at one time. The Gilded Room is, indeed, a masterpiece in that

it is all designed in gold mosaic with legendary figures inlaid in panels, and the ceiling is fully 60 feet from the floor. A dinner was given, at which prominent delegates delivered short addresses, each in his own language. This evening was one that all delegates will always remember, because of its impressiveness, its dignity and its environment.

On Tuesday afternoon, the day preceding the banquet, the delegates and ladies were invited to meet the King and Queen of Sweden in the royal castle. Everybody was assigned a certain room to stand in, according to the country from which they came; but as H. M., the Queen, was very ill, her son, H. R. H., the Crown Prince, acted as host. He marched through the double line of guests, bowing cordially and greeting each nationality in their native tongue. Everybody walked around through that floor of the castle, and then went to the upper floor, where tea was served, and there was plenty of punch and wine as at any other modern tea party.

The first gathering of the congress was a very magnificent dinner and dance at the Berns Salonger on the evening of Monday, July 23. There were well over a thousand people at this dinner dance, and the whole congress started off with a great spirit of comradeship.

On Tuesday morning there were a few sections which met, and at noontime everyone assembled in the Concert House, where the official opening was conducted in the presence of H. R. H., the Crown Prince. The president of the congress, Professor Gosta Forssell, made an opening address in German which was followed by a most scholarly and diplomatic speech in English by H. R. H., the Crown Prince. Professor E. Trygger, chancellor of the Swedish Universities, addressed the gathering in French, and then Mr. Stanley Melville of London spoke in place of Sir Henry Rawlston, who was prevented by illness from attending. At the conclusion of this speech, Mr. Melville with Mr. C.



Thurstan Holland of London, who was president of the First International Congress, presented Professor Forssell with a gold chain of 24 links that is to be the insignia of office for this and all future meetings of the international congress. Inasmuch as the congress meets only every three years, it will be many years before it will be necessary to add other links to the chain.

With the congress formally declared open, meetings were immediately started, and an innovation which everyone enjoyed was, that in each of the six meeting rooms a large bulletin board showed the exact numbers of the papers being read simultaneously in the other rooms. This made it very easy for the members to go from room to room to hear whatever papers they desired.

The chairman's secretary of each section had electrical timekeepers on their desks so that when the time was up a brilliant red light flashed in front of the speaker. This did a great deal toward speeding up the program and keeping the discussers from taking up too much time.

It is greatly to be regretted by us who were interested in physical therapy that practically the whole program was taken up with radiology. The program of the First International Congress was devoted possibly two-thirds to radiology, whereas the recent program of the congress was almost all devoted to x-ray. There were really only seven papers on medical electrology, as they call it, and four of the speakers on this program evidently were caught or held up somewhere in Russia. They were all from Leningrad and did not appear. Consequently, much to the disappointment of your delegate, only his paper and two others had anything to do with electrotherapeutics. There were only two papers in English on ultraviolet, one of which was by Professor Bachem, who is one of the prominent members of this organization. I was personally unable to hear Professor Bachem's paper, and I would not attempt to offer you a criticism of it, for we know his reputation so well. Perhaps he can supplement this report with a few words regarding his experience and the meagre discussion on ultraviolet.

In the section on the treatment of asthma and tonsils, Dr. William D. McFee of Haver-

hill, Mass., read a paper on the "Use of X-Rays, Ultraviolet Light and Electrodesiccation in the Treatment of Tonsils." In the section on medical electrology, your delegate read a paper on the "Electrical Treatment of Subacromial Bursitis." Dr. W. Westmark of Stockholm read a paper on the "Effect of Experimental Temperatures Created by Diathermy on Rat Tumors." This was in the nature of a preliminary report of experiments that will be later carried on in tumors in human beings. Dr. S. Larsson, also of Stockholm, presented slides and described the treatment of two cases of leprosy lesions on the eyeball which he treated with electrocoagulation.

It is regrettable that these were all the papers presented in electrology and it is hoped that when the congress meets in Paris in 1931 that many members of this college will be able to be present, for the idea was started in Stockholm to have the Fourth International Congress held in Chicago in 1934.

No report of this second international congress is complete without putting on record the universal thanks that everyone felt to Dr. Axel Renander, who was the honorary secretary-general, and who really did all the secretarial work, even though he had the honorary title. To him is due the credit of the wonderful success of this congress which was held in such charming surroundings, and was so efficiently handled.

—Norman Edward Titus, M.D.  
New York City

#### FRANK BUTLER GRANGER

died at the age of 53, from metastatic carcinoma of the liver.

Physical therapy shares the recent loss of Granger with the medical profession at large. With his untimely passing the Council on Physical Therapy of the American Medical Association has suffered the loss of one of its active members, a pioneer in the specialty. He was a clinician and teacher of wide experience. His criticism was always benign and constructive and his judgment well balanced. To have attained the outstanding eminence of the special confidence of our parent organization, the American Medical Association, was an honor well merited. Most of us remember him for his genial smile

and his sympathetic comradery. His was a full life, a busy and constructive one, that like the close of a good book, has left a delicate perfume of sad but never forgotten memories. The recollection of his personality and the rich accomplishment that he has left behind him will, like all good deeds, perpetuate his name into the very dim recesses of future medical history. We mourn his passing, pay sad homage to his name, and offer condolence and sympathy to his family.

We quote the following notice from the columns of the November 3rd issue of the *Journal of the American Medical Association*:

Frank Butler Granger, Boston; Harvard University Medical School, Boston, 1902; member of the Council on Physical Therapy, American Medical Association; lecturer on physical therapeutics, 1906-1910, and assistant professor of physical therapy, 1927-1928, Tufts College Medical School instructor, Harvard Medical School, courses for graduates, 1911-1925; physician for physical therapeutics, Boston City Hospital, and neurologist to the Boston City Dispensary; formerly on the staffs of the Boston Floating Hospital, Chelsea (Mass.) Memorial Hospital and the Sturdy Memorial Hospital, Attleboro; entered the medical corps of the U. S. Army during the World War as captain and was discharged in 1919 as a lieutenant colonel; organizer and director of the department of physical therapy, division of physical reconstruction, Surgeon General's Office, Washington; at one time counselor of the medical council of the U. S. Veterans' Bureau; past president of the American Academy of Physiotherapy and the American Electrotherapeutic Association; member of the American Roentgen Ray Society; author of "Technic of Physiotherapy;" aged 53; died, October 23, of metastatic carcinoma of the liver.

#### AMPERE'S HOUSE

The house at Poleymieux, near Lyons, France, in which Ampere spent his childhood and boyhood, has recently been acquired by the *Societe Francaise des Electriciens*, which will maintain it as one of the historical buildings of France.—The *Electrical Review*, CIII, 2643, July 20, 1928, p. 112.

#### PHYSICAL THERAPY CLINICS

A special feature section under the title "Physical Therapy Clinics" starts elsewhere with this issue of the *Archives*. Each succeeding issue will contain clinical cases from the various hospitals and clinics of the country. It is our desire to make this section interesting, authoritative and practical. Arrangements have already been made with several of the leading clinics for material to be used in this section.

#### HIGH FREQUENCY X-RAYS

Extreme high frequency x-rays, generated in a million-volt tube, are the next item of promise on the program at the California Institute of Technology. Allied to the investigation of the cosmic rays, which has recently yielded interesting results, is an attempt at the artificial production of very short waves, and therefore very penetrating radiation. In the hands of Messrs. C. C. Lauritsen and R. D. Bennett this work has already yielded some promising results.

As yet no apparatus can be devised for handling the terrific electric potential required for the artificial production of cosmic rays. For intermediate rays of about one-twenty-thousand-millionth of an inch wave length, however, there seem to be experimental possibilities. Such rays are much shorter than the surgeon's x-rays and much more difficult to produce.

The x-ray "tube" used in the new work is several yards long. A water-cooled anode raised to a potential of a million volts pulls electrons violently out of the nearby cathode; under this terrific force the electrons attain a speed very near 186,000 miles per second, the velocity of light. Striking the anode at this enormous speed the electrons generate x-rays like the gamma rays naturally emitted by radium.

In preliminary trials now being made in the high pressure laboratory of the Institute, where a million volts to ground at a thousand kilowatts is available to the experimenters, Messrs. Lauritsen and Bennett have succeeded in obtaining continuous operation of their new tube at voltages that have approached the million mark. The high frequency rays produced were observable through the steel doors of the laboratory more than 100 feet away.—*Science*.

Reprinted from British Journal of Radiology, Vol. 9, Sept., 1928.

## REPORT FROM THE INTERNATIONAL X-RAY UNIT COMMITTEE

The International X-ray Unit Committee has come to unanimous agreement regarding the standardization of x-ray measurement, and forward to the meeting of the delegates of the Second International Congress of Radiology the following proposals for endorsement and promulgation:

1. That an international unit of x-radiation be adopted.

2. That this international unit be the quantity of x-radiation which, when the secondary electrons are fully utilized and the wall effect of the chamber is avoided, produces in one cubic centimeter of atmospheric air at 0° C. and 76 cms. mercury pressure, such a degree of conductivity that one electrostatic unit of charge is measured at saturation current.

3. That the international unit of x-radiation be called "the Roentgen" and that it be designated by the letter small "r."

4. That various standard methods be employed to establish the unit.

5. That for all comparative purposes it is advisable to employ ionization chambers which have been calibrated in terms of a standard chamber for x-radiation of the various qualities employed. It is also advisable to make the wall effects of these chambers as small as possible.

6. That the practical instrument used to measure x-ray output be called a dosage meter (dosismesser, dositetre).

7. That the constancy of the indications of the dosage meter be tested by means of gamma radiation emitted from a definite quantity of radium element, the measurement being carried out always under the same conditions.

8. That any specification of dosage is incomplete without specifying the quality as well as the quantity of the radiation. The quality of x-radiation used for practical purposes is very varied and it would be impracticable to give a complete specification of it; but much

information can be obtained from a knowledge of the degree of absorption of the radiation in standard materials, the peak voltage applied to the tube together with the filter employed, and the general character of the high tension apparatus.

For practical purposes the quality may be expressed by stating the half value layer in a suitable material, or by stating the effective wavelength as determined by the percentage amount of radiation transmitted through a given thickness of a suitable material (copper or aluminum).

In view of the fact that rapid progress is being made in methods of x-ray measurements and in our knowledge of x-ray phenomena the committee feels that the above recommendations should be regarded as being of a provisional character.

MANNE SIEGBAHN, *Chairman.*

E. A. OWEN, M. HOLTHUSEN,  
*Honorary Secretaries.*

## THE LIGHT TREATMENT OF EYE AFFECTIONS

Dr. Harston in his valuable paper on this subject has brought to our notice a matter of great importance and we would ask the growing number of our members who are interesting themselves in the use of light in treatment to let us have more of their own experiences in practice for publication.

We have unfortunately to see this ourselves from the point of view of an outsider, but of late we have several times heard remarkable statements of the value of light treatment in eye affections. Recently we had the pleasure of the company of one of our leading doctors, who had himself been taking this treatment for an ocular affection and who spoke about the results, especially as regards the relief of pain, with unbounded enthusiasm.

Perhaps the ophthalmological section of the coming conference would take up this matter for the general information of members.—The China Medical Journal, Vol. 42, No. 7, July, 1928.



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# THE STUDENT'S LIBRARY

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**THE THEORY AND PRACTICE OF RADIOLOGY.** By *Bernard J. Leggett*, M.R.C.S., L.R.C.P., A.M.I.E.E. Radiologist, East London Hospital for Diseases of Heart and Lungs; Radiologist, St. Mark's Hospital for Cancer and Diseases of the Rectum; Consultant Radiologist, Royal United Hospital, Bath; Late voluntar roentgenarzt, Krankenhaus Der Judischen Gemeinde, Berlin; Late Diagnostic Radiologist, Middlesex Hospital, London. Four Volumes—illustrated. St. Louis, Mo., C. V. Mosby Company, Publishers.

**GRENZEN DES NORMALEN UND ANFANGE DES PATHOLOGISCHEN IM ROENTGENBILDE,** *Alban Kohler*, pp. 582, illustrations 324, published by Georg Thieme, Leipzig. Price 36 gold marks.

As the title of this book implies, this is a presenta-

tion of the normal and early pathological roentgen changes found in the human body. The author takes up the subjects in detail beginning with the hand and upper extremities, then the feet and lower extremities, then the pelvic bones, ribs, head and chest—discussing in order the lungs, heart and great vessels and following this with the digestive tract and accessory organs and genito-urinary tract. The description is fascinating reading, is sufficiently detailed that nothing has been overlooked and the various types of pathology are illustrated by drawings and x-ray reproductions. The text is presented in a very clear manner showing not only a knowledge of the subject in hand but a knowledge of pedagogy as well. This is an invaluable reference book in any office where the x-ray is ever used, as well as in the office of the specialist.

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## INTERNATIONAL ABSTRACTS

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**The Roentgen Ray in the Diagnosis of the Diseases of Duodenum and Gall Bladder.** *F. M. Hodges*, *Radiol. Rev.* 50:472, 474, Dec. 1928.

In the study of gall-bladder disease, duodenal ulcer, and partial obstruction of the duodenum, the symptoms are frequently indefinite or misleading. It is very important, if medical treatment is to be considered in ulcer, to eliminate disease of the gall-bladder. Disease of both structures is sufficiently frequently associated to demand as accurate information as possible in regard to the condition of both.

Neither the dye test nor barium studies alone will give the information; but by combining the methods some defects of the duodenum now being treated for ulcer, will be proven to be due to gall-bladder disease with adhesions; and the cause of more symptoms referable to the upper right abdomen will be found than is possible by the use of either method alone.

**Roentgen Ray Treatment of Malignant Bone Tumors.** *C. P. Rutledge*, *New Orleans Med. & Surg. J.* 81:406-409, Dec. '28.

Roentgen ray therapy is of proven value in the treatment of malignant bone lesions.

Malignant bone lesions should be given roentgen ray treatment, regardless of whatever other form of treatment is contemplated.

We should report our cases not only to Radiological Societies but to general meetings of this type as very little appears in the general medical journals on this subject.

**Radiation in Sarcomata.** *L. Fortier and T. T. Gately*, *New Orleans Med. & Surg. J.* 81:406-409, Dec. '28.

It is well known that radiation can cure the simple epithelioma of the skin before it has metastasized to the glands and it is also a known fact that carcinomas of the esophagus, stomach and liver are very rarely cured by roentgen ray or radium. Several cases are presented in this article of some of the sarcomata—cases just in between the two groups mentioned above which have received radium treatment and responded very encouragingly. In this group are seven sarcomata of the lymphoid origin, two fibro-sarcomata, and three unclassified sarcomata one each of the lungs, tonsil and cervical vertebrae.

**Tuberculosis in Infants and Young Children.** *L. B. Dickey*, *Calif. & West. Med.*, 29:383-392, Dec. '28.

Tuberculous infection is fairly common in infancy and early childhood. In the absence of symptoms and roentgen ray findings these patients carry the infection usually without developing evidence of marked disease. Occasionally those having marked evidence of disease may carry the disease for a considerable time with no increase of signs or symptoms. Seventy-seven per cent of the children under four years of age in our series that were positive reactors to tuberculin developed no evidence of tuberculous disease. The intracutaneous test and the roentgen ray are the most valuable aids in diagnosis.



**X-Ray Therapy in Dermatology. L. F. X. Wilhelm, Calif. & West. Med. 29:381-384, Dec., 1928.**

X-ray is not a panacea for all skin diseases; it should constitute only a part of our therapeutic armamentarium for skin diseases. X-ray if properly controlled is the most useful agent we possess for the treatment of diseases of the skin. A positive diagnosis, plus discovery of the underlying etiology of the condition present, if possible should precede x-ray therapy in all dermatologic conditions. Skin toleration tests to discover individual susceptibility to x-ray add a positive safeguard against undesirable reactions. Patients should be inspected carefully before each x-ray treatment for premonitory signs of intolerance.

Dosage should be accurately controlled by scrupulous measurement of spark gap, skin distance, milliamperage and time of exposure.

When using fractional dosage a total of two units (MacKee) x-ray should be the maximum amount of treatment used during a period of two months. X-ray should not be used in treating generalized psoriasis. Skin tolerance must not be regarded as a limiting criterion in treating mycosis fungoids with the x-ray. Irritating topographic applications must be avoided before, during and after a course of x-ray treatment. X-ray preferably should be used in conjunction with electrodesiccation and curettage in treating cutaneous malignancies.

**A Case of Foreign Body Impacted at the Duodenojejunal Flexure. J. E. Habbe, Am. J. Roentgenol. 20: 370-372, Oct., 1928.**

A case of foreign body (nail  $1\frac{3}{4}$  in. long) impacted in the terminal duodenum for a period of approximately three weeks, is reported. The patient remained symptom free through the entire period of its lodgement. After failure of expectant and medical therapy over a three-week period, operative removal was performed. A check-up roentgen study of the gastro-intestinal tract made three months after operation revealed no evidence of abnormality; hence it is reasonable to assume that this patient will be no more prone to organic gastro-intestinal disease in later life than if she had never swallowed the foreign body.

**The Roentgen Ray in the Diagnosis of Primary Pulmonary Neoplasm. B. P. Stivelman, J. A. M. A. 91: 1690-1694, Dec. 1, 1928.**

The roentgen ray is of great value to the clinician in the diagnosis of primary pulmonary malignant conditions when he is acquainted with the type of evidence it has to offer. In early cases, tumors near the hilum and those that spread along the bronchial arborization cannot be definitely diagnosed without the x-rays.

Early bronchogenic tumors which have not grown large enough to obstruct the bronchus and flat pleural tumors may be missed roentgenologically when physical observations may point to their existence. Central tumors, regardless of their point of origin, are visible

roentgenologically long before other methods of examination will suggest their presence. In the presence of large effusions, primary lung tumors cannot be diagnosed by means of the roentgen ray unless the fluid is aspirated and a diagnostic pneumothorax induced for contrast purposes. Spontaneous free or interlobar empyemas and pulmonary abscesses not of metapneumonic origin when they occur in persons past middle life are in themselves suggestive of a possible malignant condition regardless of equivocal x-ray observations. In difficult cases films in the oblique positions, bronchography with iodized oil and particularly early bronchscopy must be resorted to for a correct diagnosis.

**Heliotherapy (Natural and Artificial): Its Limitations in Pediatrics. L. W. Sauer, Illinois Med. J., 54:296-298, Oct., 1928.**

Heliotherapy has a definite but limited field of usefulness in pediatrics. Artificial heliotherapy should be used only when natural sunlight is not practical. Harm from chilling and overexposure must be avoided. Heliotherapy should be resorted to as an aid in treatment only in those conditions that are benefitted by its use.

**Artificial Pneumothorax with High Intrapleural Pressure in Patients with Pleural Adhesions. R. W. Dunham, Illinois Med. J., 54:267-269, Oct., '28.**

High intrapleural pressure is of decided value in many cases presenting pleural adhesions that will not respond to pneumothorax with low pressure.

There is very little danger of tearing or rupturing the lung tissue if the case is carefully watched and the pressure increased gradually.

It should be tried in all cases where pleural adhesions are encountered during the course of pneumothorax. The danger of injury to the lung will be greatly reduced if frequent fluoroscopic examinations are made during the course of treatment.

**Benign Neoplasms of the Bronchus. M. C. Myerson, Am. J. Med. Sc., 176:720-726, Nov. 1928.**

An analysis of the literature reveals a fairly large variety of benign, pulmonary neoplasms. The number of neoplasms which will be removed in the future is expected to show an increase, for the increasing recognition of the value of bronchoscopy and its more frequent application justify this prediction.

A case is cited in which a patient with pulmonary symptoms was treated for tuberculosis, asthma, chronic pulmonary fibrosis and myocarditis, while the basis for his trouble was the presence of a fibrolipoma in his left main bronchus. This case demonstrates the importance of including bronchoscopy in the study of pulmonary conditions with obscure or atypical symptoms. It also demonstrates that we can hope to save the lives of patients who have benign neoplasms of the bronchus by a timely bronchoscopy.

**Spontaneous Non-Tuberculous Pneumothorax.** E. G. Stoloff, *Am. J. Med. Sc.*, 176:657-664, Nov. 1928.

A review of the literature from 1844 to the present date allows a tabulation of 84 cases of spontaneous pneumothorax of non-tuberculous etiology.

The etiology and pathogenesis of spontaneous pneumothorax with particular reference to the accompanying compilation was considered. Tuberculous disease is probably the most frequent single cause. Pneumonia follows with a 35.7 per cent incidence in this tabulation; then emphysema and gangrene. Expressed pathogenically, pneumothorax may be caused by (a) degeneration in the lung (abscess, gangrene, bronchiectasis, infarction, empyema) or (b) rupture of the lung due to congenital defect, emphysema, foreign body.

The roentgen diagnosis is discussed. Pneumothorax, either open, closed, or of the check-valve variety, may be seen as partial or total, unilocular or multilocular, simple or complicated, and unilateral or bilateral.

Three cases of nontuberculous spontaneous pneumothorax are added to the literature: All were post eventful recoveries. Their recognition was made on the basis of roentgenography; they were characterized by a sparsity of clinical manifestations and signs which probably would not have sufficed to enable the diagnosis in the absence of the roentgenograms and fluoroscopy.

**Gastric Polyposis.** A. A. Strauss, J. Meyer and A. Bloom, *Am. J. Med. Sc.*, 176:681-689, Nov. 1928.

A report is made of two cases of gastric polyposis, polyadenoma, *en nappe*, thus increasing the number reported to seven. The clinical picture of gastric polyposis while not definitely characteristic is suggested by the story of a chronic gastric discomfort, repeated gastric hemorrhages, achylia gastrica, increased or normal consistency, the general appearance of well-being and a characteristic mottling of the gastric roentgenogram. The problem of clinical diagnosis is one not only of recognition but of differentiation from chronic gastric ulcer, gastric carcinoma, gastric syphilis, achylia gastrica. Where the extent of involvement permits, gastric resection after the manner of the Polya resection is advised.

**Raynaud's Disease Associated with Cancer of the Stomach.** T. I. Bennett, *Am. J. Med. Sc.*, 176:654-657, Nov. 1928.

A case of Raynaud's disease with symmetrical gangrene of the fingers of both hands is reported. Post-mortem examination revealed carcinoma of the stomach with secondary carcinoma cells in the inferior cervical ganglion. The presence of these cells in the ganglion were considered to be the cause of the Raynaud's disease.

One case with closely similar clinical features is recorded in the literature.

**Therapeutic Pneumothorax.** J. Rosenblatt, *Rhode Island Med. J.*, 11:182-184.

Induced pneumothorax has been employed very successfully in pulmonary tuberculosis. However, the number of cases suitable for this treatment is very small. The nature of the lesion which would indicate the above treatment is discussed by the author. The technic of the treatment is also described and the common causes of failure, the most common complication of which is pleural effusion. The total number of cases benefitted by the treatment, either temporarily or permanently is 86 and those who derived no benefit, 76.

**Treatment of Bronchial Asthma with Roentgen Rays.** S. Strelkov, *Vestnik Roentgenolog.*, No. 5, 1927.

The author has treated 23 cases, most of which represented grave forms of bronchial asthma in which the attacks were either very frequent or lasted for weeks. The radiation was applied to the pulmonary roots in four fields, with one field applied anteriorly to the spleen. Each field was given 20% of an erythema dose with 25 centimeters focal distance from the skin, the rays being filtered through 3 millimeters of aluminum. One field was radiated daily, and this series was repeated in a month. In a few cases which were complicated by Basedow's disease, 2 lateral fields were radiated in addition to affect the thyroid gland, and the sympatheticus. In 2 cases approaching the climactic radiation of the ovaries produced excellent effects. Summing up his therapeutic results, the author reports four patients to have shown complete disappearance of the attacks for five years—a total of 17%. Eight cases were greatly improved and had no attacks for from two to three years—a total of 34%. Nine cases, or 39% were improved, for the attacks appeared considerably less frequently than before and were very mild in comparison. In two cases, the treatment was ineffective.

The result of the treatment can be noticed as early as after the first series but a decisive effect is seen only after the third or fourth series.

The author cautions that radiation should be applied only in cases of pure bronchial asthma, for in three cases of cardiac asthma, the treatment proved ineffective. Furthermore, the result depends to a very great extent on whether the disease is recent, for in older cases with extensive pathologic changes, particularly emphysema, no improvement need be anticipated.

The author has made careful studies of the blood changes and noticed a diminution of the eosinophiles of the blood. This also applies to the sputum Charcot-Leiden crystals and Curschmann's spirals either disappeared or become diminished.

It can be seen from the laboratory studies that the improvement is not due to a psychic effect. While the author is unable to state in what manner the roentgen rays produce this effect, he urgently recommends their application in which the classic therapy has given unsatisfactory results or has proven useless.

**Gastric and Duodenal Ulcers.** W. S. Wyatt, *Kentucky Med. J.*, 26:552-556, Nov. 1928.

The incidence of gastric and duodenal ulcers is more frequent in Denmark than any other nation. They occur more frequently in men than women, the ratio being three to one. They may occur at any stage in life, although they are most frequently found in the ages between 30 and 50 years. Statistics of late years prove that duodenal ulcers are more common than gastric ulcers.

Etiology may be due to infection, toxins or systemic disease.

The safest method in treatment of gastric ulcers is excision or gastrectomy. Medical treatments have proven quite satisfactory in treating duodenal ulcer if symptoms have not been present over a year. When more than a year, the percentage of cures is small.

**Surgical Diathermy in Treatment of Cancer.** S. H. Graff, *Calif. & West. Med.*, 29:348, Nov. 1928.

Surgical diathermy has as yet received but slight recognition from members of the profession.

The advantages of the diathermy knife is outlined in detail, some of which are: its control and technic are easier; the skin flaps healed by first intention; no postoperative shock; no loss of blood; no afterpain and dissection may be done much closer to the malignancy, which will give less scarring.

**Fluoroscopic Examination of the Paranasal Sinuses.** R. A. Powers, *Calif. & West. Med.*, 29:338, Nov. 1928.

An analysis of the tabulated results in this small series brings into emphasis two important clinical points:

1. A fluoroscopic examination of the chest should be accompanied by a fluoroscopic survey of the paranasal sinuses (when a radiographic examination of the latter is not intended.)

2. Sinus pathology should be searched for in all cases of respiratory infection.

**Frames for Taking Roentgenograms of Infants.** H. Abramson, *J. A. M. A.*, 9:1546, Nov. 17, 1928.

Owing to the fact that it is difficult to hold children quiet while taking a roentgenogram, and of the consequent blurring and disfiguring of the picture, frames of pine wood have been constructed which hold the child in position by means of straps. These frames are described by the author. They are used in taking pictures of the chest and wrists.

**Hodgkin's Disease Thirteen Years After Treatment with Roentgen Ray and Radium.** G. A. Robinson, *J. A. M. A.*, 91:1548, Nov. 17, '28.

A case is reported of a man 23 years of age who had a large node removed from his neck, and was diagnosed as Hodgkin's disease. The other nodes on his neck disappeared after six roentgen ray treatments

and no further trouble was noticed until four years later when a recurrence of the nodes was noticed and this time, after a series of radium treatments, they disappeared again. In 1926, he complained of swelling of the glands in his neck again and pains in the lower part of his back, however these symptoms disappeared for a period of eight months after radium treatment. His condition at this time was much worse than before and radium was again administered, but at the time of this writing the patient had become steadily worse after three months treatment. Although Hodgkin's disease is usually fatal, irradiation, particularly with radium, relieves pain, reduces tumor masses and prolongs the life of the patient from several months to a few years.

**Congenital Atresia of Aortic Ring.** N. Philpott, *Ann. Int. Med.*, 2:422-427, Nov. 1928.

Cardiac defects, etiologically are divided into two groups: (1) arrest of growth and (2) fetal disease. Syphilis is prevalent in the causation of many cardiac defects.

Aortic atresia is not common. A case is recorded of an infant who lived only sixty-two hours after birth. Cyanosis was noted the first day and continued until death. Postmortem examination confirmed a diagnosis of congenital atresia of aortic ring with absence of aortic valve.

**Ultraviolet Rays.** G. B. Lake, *Radiol. Rev.*, 50:422-424, Nov. 1928.

If physicians will understand that ultraviolet rays are a remedy potent for good or harm; will study their characteristics, indications, limitations and dangers; and then will apply or prescribe them, with the same attention to details of individual susceptibility, physiologic action, dosage and frequency of application, and with the same meticulous judgment which they employ in the use of drugs, the result obtained will be equally predicable and satisfactory.

**Alpine Sun Treatment of Whooping Cough.** I. Becker, *Munchen Med. Wchnschr.*, No. 25, '28.

The author has embraced the opportunity when his own children developed whooping cough to treat them with the alpine lamp and has demonstrated the efficacy of this method by carefully prepared charts.

His observations with radiation of ultraviolet light show that during the convulsive stage the attacks are delayed, so that during the night the attacks are fewer in number. Tests were made to show that inhalation of the gases from the lamp alone had no effect, so that there is no doubt left that the good effect is solely due to the effect of radiation.

**The Treatment of Hyperthyroidism.** Edward Rose, *Am. J. Roentgenol.*, '28.

Rose concedes that surgery is the best and most effective method of treating hyperthyroidism, and regards internal and roentgen therapy merely as sup-



portive or second—in certain types of this malady. All focal infections must be looked after as the first step in therapy. Roentgenotherapy may be tried in mild cases, in acute cases, if the patient can be kept under medical observation for at least several months, and finally as a substitute for surgery in such complicated cases in which a surgical operation appears too risky. Surgery is absolutely indicated in adenomata of the thyroid gland and when roentgen therapy has failed to produce any results.

#### **Treatment of Bronchopneumonia of Children with Roentgen Rays. Sophie Bothner, Munchen. Med. Wchnschr., No. 29, '28.**

Basing on the labors of Fried, the author has radiated seven children who were suffering from bronchopneumonia, all patients of the pediatric clinic of the University of Tübingen. She administered for this particular purpose ten per cent of the erythema dose, filtering the rays with half a millimeter of zinc and millimeter of aluminum at a focal distance from the skin of 40 centimeters. The author came to the conclusion that the results were not encouraging. In light cases there was noted some improvement after radiation, but this occurs without radiation too. In the grave cases, however, radiation did not prevent the patients from dying.

#### **The Roentgen Treatment of Basedow's Disease. Dornkaat-Koolman, Ztschr. Physik. Ther., No. 35, '28.**

Seven cases of Basedow's disease have been treated by the author by the following technic. The rays were applied to one field each, right and left of the thyroid gland by means of lead glass tubes ranging in diameter from  $4\frac{1}{2}$  to  $5\frac{1}{2}$  centimeters, depending upon the size of the gland. The middle part was never treated, and on the contrary, carefully protected against the rays by a suitable cover. A third application was made to the region of the thymus gland over all areas of ten by fifteen centimeters. An interval of eight days was allowed to elapse between each of the three applications. Throughout a Coolidge tube was used at a focal distance of 30 centimeters with a half centimeter thick copper filter. 100-150 R. was given in each application. Only occasionally was a "reaction" observed in the form of a slight nausea, while pigmentation of the skin and telangiectasia were never observed. The author finds that his results correspond with those of other authors, namely that the tumors improve as do the nervous and subjective heart phenomena, the profuse sweating becomes diminished and loss of weight stops, in some cases, the improvement being marked even by a gain. While the struma itself was not affected as far as size is concerned, the exophthalmus became less, but a complete disappearance of eye protrusion has not been attained in any one case of the series.

#### **X-Ray Treatment and Surgery in Cancer of the Mamma and in Chronic Mastitis. J. H. D. Webster, Lancet, No. 715, '28.**

Basing on a study of 600 cases of cancer of the breast and 60 cases of chronic mastitis, the author comes to the somewhat startling conclusion that early surgical operation need no longer be regarded as the only salvation of the sufferers. Roentgen therapy alone, or at least as the principal therapeutic method will produce similar results to those observed in cancer of the cervix, that is to say, the operative results are enhanced while a certain percentage of the inoperable cases can be cured. Much can be expected from the combined methods, and artificially produced menopause through radiation is of great help. The natural tendency to recovery seen in isolated subcutaneous nodules can be enhanced by radiotherapy resulting in degeneration of the cancer cells and reaction of the connective tissue. Operative extirpation often leads to rapid growth of foci which have previously been dormant. The author invites attention to the fact that the best means to stimulate a tumor to grow is to incise the neoplasm as has been demonstrated clinically as well as experimentally. In order to prevent post-operative recurrences, the operative field and adjacent lymphatic regions should be subjected to radiation before and after operation.

The author strongly opposes the idea that roentgen therapy is merely an adjuvant to surgery, to be utilized only after operative methods have failed, and demands independent hospital departments for roentgen therapy.

Webster points out that in London, the annual mortality of mammary cancer has increased from 400 to 500 within the last ten years, and that an improvement of this situation cannot be expected from surgery, which has already attained the very pinnacle of success.

#### **Ultraviolet Treatment of Alopecia Areata. P. Alinet and J. Berges, Archives de la Soc. des Sciences Med. de Montpellier, p. 69.**

The authors report their experience in a male patient with extensive alopecia that was located largely on the nape of the neck. Medicaments were first utilized, such as tincture of iodine and oil of cade. The lesion however became larger. The stimulating effect of pilocarpin was then tried, but the growth of the lesion was not arrested. It progressed in spite of the treatment until the whole scalp, beard and eyebrows were affected. Consultation was called in, and Prof. Margarot, the consultant, advised ultraviolet therapy. The author then gave local ultraviolet treatment, starting with two-minute exposures, three times weekly, increasing the treatment by one minutes until the duration was twenty-seven minutes.

Fine, down-like hair was then noticed to appear on the temples and chin. Finding this insufficient for the head, the treatment to the head was increased. A fresh growth of hair resulted at the vertex and extended to the frontal region. The original patch on the neck where the disease began, became covered with fine down, the sign of an approaching cure. This is



but a confirmation of the experiences of other investigators of the beneficial value of ultraviolet light in selected cases of alopecia. The authors agree that general exposures are valuable adjuvants.

**The Inspiration of Atmosphere Irradiated with Ultraviolet Rays. Luigi Spolverini, La Radiologica Medica, Vol. 15, part 4, April, 1928.**

Rachitic children were studied whereby patients were treated by administering air charged with previously irradiated ultraviolet rays. No direct application of these rays was attempted. The children were treated from ten to twenty minutes by permitting them to breathe in the irradiated air three times a week. X-ray pictures taken after one to four months following this experiment revealed that these patients were rachitic free.

**Treatment of Alopecia by Ultraviolet Rays. L. Leiter, Wien. Med. Woch., p. 302.**

Good results have been reported in the treatment of alopecia. The author reports several cases. One, a youth of seventeen, who was completely bald including complete loss of hair from the eyebrows. The technic utilized was as follows: The scalp was divided into four segments. Each part was irradiated separately with the rays, the other portion being covered. In all, twenty-seven treatments were administered, seven to each segment. The result was a thick growth of hair all over the head.

Another case of a boy five years of age who had an extensive patch of alopecia on the back of the head and a smaller one in the front is cited. A total of fourteen treatments divided seven to each area produced a thick covering of hair.

**Disease Affecting the Distal Half of the Colon, (Ed.) A. B. Morse, J. A. M. A., 91:1094, Oct. 13, '28.**

Diverticula are found most frequently in the distal half of the colon. Of all roentgenologic abnormalities of the colon in the Mayo Clinic, about one-third were cases of diverticula. The characteristics which are usually present in diverticula are the localized narrowing of the sigmoid, associated with round or oval extraluminal shadows either in the region of the stenosis or elsewhere in the colon.

Carcinoma of the distal portions of the colon is quite common. It is usually recognized by a narrowing defect in the barium shadow and obstruction to the enema. The roentgenologic manifestations of carcinoma except the napkin-ring type are less distinctive than those of other common diseases of the colon.

Most diseases of the colon produce pronounced diagnostic signs, early lesions are more difficult to discover, due to the fact that the colon is hard to study. It is several feet in length and many of the small irregularities seen in examination do not warrant the diagnosis of a disease. Cooperation with the roentgenologist is a great help in overcoming these handicaps.

**Statistical Studies of the Effect of Ultraviolet Irradiations. Jose Castillo and Feliza De Jesus, J. Philippine Islands Med. Assn., Vol. VIII, No. 8, Aug. 1928.**

Air cooled ultraviolet irradiations were administered to 350 patients suffering with either chronic skin lesions or systemic disorders. The preponderant cases were the surgical tuberculous types, such as adenitis, peritonitis, sinusitis; of the skin affections the ulcerous and indurated lesions predominated. Eighteen skin burns are included in these studies. The percentage of cures and definite improvements warranted the authors to make the following conservative conclusion: "We cannot positively say that the improvement in the cases we are reporting was due primarily to our treatment. We have no way of telling how large a part the hygienic condition, the medicine given, rest and good food instituted during our period of treatment played in the improvement; but what we can positively say is that the ultraviolet rays were a decided adjuvant in the treatment of the above mentioned cases."

**Ultraviolet Rays as Adjuvants in the Treatment of Leprosy. M. C. Cruz, of the Culion Leper Colony, J. Philippine Islands Med. Assn., Vol. VIII, No. 7, July, 1928.**

Thirty-four lepers were treated by contact application of ultraviolet. The lesions were of the infiltration, nodular erythematous macules, infiltrating ulcers, and trophic ulcers of the plantar surfaces. Water cooled unit was employed and the affected areas were irradiated at different lengths, varying from minutes to hours. The longest exposures were given to the hard infiltrated types. The results in these cases were practically negative. This may have been due to the superficial penetration power of the energy, which did not evoke any bactericidal effect on the underlying bacteria, except in two cases. The results in these were spectacular. Not only did the treated lesions disappear but also the untreated ones. The effect on the erythematous macules and the trophic ulcers was also practically negative.

The leprotic ulcers showed 70 to 85% improvement, after 11 to 16 exposures. This indicates that contact ultraviolet irradiation in selected cases is of great benefit, and warrants further study on a larger group of patients.

**Papillary Cyst Carcinoma of the Ovary. J. B. Deaver, J. A. M. A. 91:1008-1012, Oct. 6, '28.**

Papilliferous cyst carcinoma of the ovary in all probability originates from the germinal epithelium. It is malignant. In the great majority of cases it develops from the papilliferous cyst adenoma, although it may be carcinomatous from the start. The tendency is for these cysts to be bilateral. They contain a bloody fluid, as a rule, associated with ascites. The symptoms are similar to those of any other cystic tumor except that in carcinoma there may be an associated

loss of weight. They metastasize readily by implantation of plasma and whole blood cholesterol are re-krife judiciously used is not only a great help but is unquestionably the treatment of choice.

**Blood Cholesterol Studies in Cancer. W. L. Mattick and K. Buchwald. J. A. M. A. 91: 1087-1090, Oct. 13, '28.**

Blood cholesterol values and rations of the relation of plasma and whole blood cholesterol are reported in 20 healthy, 101 cancerous and 75 non-cancerous patients ill with various diseases.

A plasma whole blood cholesterol ration of less than one was 86 per cent of the cancer cases. This disturbed ration is probably a fairly constant finding in cancer.

A plasma whole blood cholesterol ration of less than one was the usual finding in 80 per cent or more of the healthy.

In non-cancerous diseases this ration seemed to be in accordance with that in health in 67 per cent, whereas in 33 per cent it was reversed, as in cancer, which is possibly explained on the basis of a temporary derangement of this ratio in some non-cancerous diseases.

Such observations might justify a more critical investigation of the theories of the defective lipolysis as the basis of cancer pathogenesis.

**Giant-Cell Tumor of the Upper End of the Femur; Report of Three Cases. M. S. Henderson, Minnesota Med. 11:242-247, Aug., 1928.**

These three cases of giant-cell tumor in the upper end of the femur were somewhat unusual. In the first case symptoms had been present for only seven months and the tumor was excised during the active period of the growth, when the vascular mass within the cavity could be scooped out, the lining destroyed by curettage and the side walls crushed in. Roentgen-ray treatment will be carried out when the cast is removed six weeks from the time of operation.

The second case showed the terminal cystic stage of the disease. Bony union has ensued after a stormy convalescence complicated by fracture.

The third case showed the tendency to recurrence. It is probable that enough of the upper end of the bone was not removed to include the limiting membrane that is present in these tumors, and which walls off the tumors from the rest of the medullary cavity.

The two patients who had active trouble were below par, with low hemoglobin, whereas the patient in the terminal stage was in robust health.

**Fluorescence; Particularly in Dermatology. H. Goodman. Am. J. Phys. Therapy, 5:203-208, Aug. '28.**

Lesions such as warts, epidermal scales, fringes of scaly lesions, give the characteristic fluorescence of the horny layer composing them as evidenced in the teeth, nails, and normal palms.

Natural blonde hair and canities fluoresce; the less pigment in the hair, the greater the fluorescence, so that in fact grey hair is clear white, shining almost in the darkness.

Inflammatory reactions of the skin surface apparently inhibit the normal fluorescence and such areas of skin appear dark, lack of fluorescence by comparison with surrounding unaffected skin which *does* fluoresce.

Presence of large blood masses, as in angioma, also act to limit the fluorescence of the skin covering them.

Pigment in the skin from previous injury, scars, pigmented lesions, likewise act to inhibit the fluorescence. Contrariwise, loss of pigment as in vitiligo or leukoderma excites fluorescence.

Still further, colored persons' skin has a fluorescence which in no wise is similar to the fluorescence of pigment bearing lesions in white persons.

Pigment deposits in the skin of white persons not discernable in daylight are very evident by the character of the fluorescence.

Areas where erythema will be present (but not yet apparent) provoked by radiation of the mercury vapor arc in quartz are indicated both in colored and white skin, hours before the erythema will appear, and within a moment of the close of the radiation.

Sequela of radium and x-ray have an apparent fluorescence which may be of value in determining the limit of dosage in the individual, thus offsetting danger of idiosyncrasy.

At least one of the vegetable parasites, micro-sporon furfur, is detectable by its fluorescence; others may be.

**Congenital Absence of the Femur, Patella, Tarsal Scaphoid, and Ischium Associated with Other Abnormalities. A. R. Shands, Jr., Am. J. Roentgenol., 19:531-538, June '28**

A case report of a man aged twenty-three is given presenting the following congenital abnormalities:

Complete absence of the right thigh.

Absence of the right femur with a small caput epiphysis remaining and a fusion of the lower femoral epiphysis with the tibia.

Pelvis. (a) Complete absence of the right ischium.

(b) Absence of the inferior ramus of the right pubis.

(c) An imperfect and small right ilium. (d) An imperfect and small right side of the sacrum.

Complete absence of the right patella.

Complete absence of the right tarsal scaphoid.

Bony defects in the parietal bones of the skull with an oxycephalic shape.

Non-descent of the testes.

A partial review of the literature on the congenital bony anomalies involved is given.

**Fractures of the Ankle. F. D. Dickson, J. A. M. A., 91:845-850, Sept. 22, '28.**

Fractures of the ankle constitute a serious injury in that interference with the function of an important weight-bearing joint often results. It is of little importance that gifted or fortunately placed surgeons can

point with just pride to a large percentage of successful results in ankle fractures. It is of importance, however, that the standard of treatment generally be of such excellence as to insure a high percentage of good results with strong weight-bearing extremities. A century ago the dictum of Dupuytren that "under the most favorable condition they (fractures of the ankle) almost always leave deformity and lameness, which renders progress difficult or painful" may have had some justification. Today, with the x-ray and modern facilities for treatment, it certainly has none.

**Roentgen Ray Diagnosis of Pulmonary Infections with the Friedlander Bacillus. K. Kornblum, M. D., Am. J. Roentgenol. 19: 513-521, June, '28.**

Friedlander's pneumonia presents a characteristic roentgen ray appearance.

Four stages of the disease may be recognized roentgenologically: (a) the stage of bronchopneumonia; (b) the stage of pseudo-lobar pneumonia; (c) the stage of multiple abscess and cavity formation, and (d) the healing stage of fibrosis.

There is also a chronic form of pulmonary infection due to the Friedlander bacillus.

Friedlander infection of the lungs must be differentiated from bronchopneumonia, pneumococci lobar pneumonia, influenza and tuberculosis.

This form of pulmonary disease is probably more common than is generally supposed.

The fibrosis resulting from a Friedlander's pneumonia may be responsible for certain cases of bronchiectasis for which no other cause can be found.

Certain cases of supposed chronic pulmonary tuberculosis in which the tubercle bacilli have never been found in the sputum may be, in reality, chronic form of Friedlander's infection.

**Radium Therapy of Tumors of the Skin at the Curie Institute of the University of Paris. G. T. Pack, Arch. Dermat. & Syph., 18:286-289, Aug. '28.**

Patients admitted to the Curie Institute are subjected to biopsy immediately as this is considered an important phase in diagnosing a case of skin cancer. Treating a cancer with roentgen ray after radium has failed, is never successful.

The focal distance of the radium from the skin depends on the nature and type of the lesion and this distance is determined by the intervention of a wax which is transparent to the gamma rays of radium. Treatment is never less than five days nor more than eight and the radium is applied from eight to twelve hours daily. The doses are greater on small cancers than large ones, often as high as  $4\frac{1}{2}$  millicuries for small cancers and as low as 2 millicuries for larger ones.

**Diaphragmatic Hernia. W. E. Hunter, California & West. Med., 29:227-231, Oct., '28.**

Diaphragmatic hernia is much more common than it is thought to be and often overlooked by the phy-

sician or surgeon, the diagnosis being made by the roentgenologist or at autopsy.

It is most often congenital and may occur at the natural openings of the diaphragm or at weak spots in the diaphragm, due to either improper development of the musculature or failure of the stomach to descend and mechanically prevent fusion of the diaphragmatic segments.

Eventration is a congenital weakness of the diaphragm, and may be due to failure of the lung to develop properly and push the diaphragm down. Non-rotation of the stomach is frequently associated with this condition. It may also be acquired from degenerative changes in the musculature or injury to the phrenic nerve.

**Colon Bacillus Infection of the Skin. G. B. Underwood, J. Indiana M. A., 21:373-374, Sept. 15, '28.**

Two cases of colon bacillus infection of the skin of the hands, forearms, both probably due to contamination from taking enemas.

Ulcers in both cases showing no tendency to heal over a long time under ordinary antiseptic treatment.

One case healed quickly under x-ray therapy. One case did not respond to x-ray therapy nor autogenous vaccine but healed quickly with surgical measures and ultraviolet light.

There is a paucity in the literature regarding colon bacillus infections of the skin yet it is believed to be commoner than supposed.

**Effect of Liquid Petrolatum Given by Mouth on Digestion and Absorption of Food. A. B. Olsen, J. A. M. A., 91:143-147, July 21, '28.**

Laboratory dogs with one meal a day have only one regular stool daily with an average motility of about eighteen hours.

The feces of the dogs uniformly contained large quantities of hair, which may serve a useful purpose as roughage and may be useful in stimulating peristaltic activity in the bowels.

The use of muzzles to prevent the eating of the hair not only worried the dogs but also seemed to cause constipation.

From the experiments on dogs it would seem that the use of liquid petrolatum given by mouth does not interfere with the digestion or absorption of protein food as judged by the fecal waste of nitrogen.

While the students considered their bowel action normal before the experiment, the fact is that all of them had a varying degree of constipation. In most cases the oil encouraged better action and produced softer and more natural stools, although the effect was comparatively mild.

The taking of 15 cc. of liquid petrolatum with meals three times a day did not appear to upset, hinder or in any other way interfere with the digestion and absorption of the food as judged by the nitrogen and



carbohydrate waste eliminated by the stools, nor did it affect appetite.

The amount of nitrogen waste as determined by fecal analysis was not increased when the students were taking petrolatum with each meal, but remained practically the same.

What is true of the nitrogenous waste holds also for carbohydrate elimination. Analysis shows that the amount of reducing substance in the feces is not increased by the taking of liquid petrolatum.

The results of both experiments, in dogs and in human beings, indicate that the taking of liquid petrolatum by mouth in therapeutic doses did not interfere with the digestion and absorption of protein and carbohydrate food.

### **The Use of Iodized Oil for the X-Ray Examination of Disease of the Female Pelvis. J. Brams and J. R. Lavieri, Illinois M. J., 53: 410-411, June '28.**

The use of iodized oil in the diagnosis of disease of the female pelvis is a very valuable diagnostic procedure and should be a part of the complete examination wherever possible. Many diseases cannot be diagnosed without it.

A new syringe for the injection of the oil is described which is believed to be an improvement over those ordinarily used for this purpose.

The lateral position of the injected uterus is suggested to determine the position of the uterus when the bimanual examination is doubtful.

### **Urography—Common Diagnostic Errors. M. B. Wesson, Radiol. Rev. & Chicago M. Rec., 50:392-399, Oct., '28.**

Pyleography was a procedure fraught with danger ten years ago, but today, because of the universal use of harmless 12 per cent sodium iodide as the opaque medium, it is no more dangerous than the passage of an urethral sound.

The ideal method of injection is by gravity, using two burettes held in a clamp 18 inches to 24 inches above the patient. Under-injection results in erroneous diagnosis over-injection (with syringes) merely spoils the films and causes the patient a few hours or days of discomfort.

Bilateral pyleograms are very comforting to the roentgenologist for most abnormalities that occur on both sides are congenital and not the result of acquired pathology.

Any patient who will tolerate bilateral ureteral catheterization is a subject for bilateral pyleography; in one case the kidney pelvis are lavaged with silver nitrate and in the other with sodium iodide.

Single pyleograms subject the patient to an unnecessary double expense.

Six cases are reported, in abstract, with roentgenographs. (a) Filling defect in normal kidney diagnosed malignant but due to stiff No. 8 Garceau catheter and syringe pressure. (b) Retroperitoneal extravasation of sodium iodide at the level of the stone following

ureterogram. (c) Stones apparently in bladder found to be in prostate, with incompetent internal sphincter due to suprapubic prostatectomy. (d) Cystogram showing hypertrophy of prostate, etc. (e) Osteomyelitis of pubis keeping open surgical sinus of opposite groin. (f) Rupture of the diaphragm, a complication of pyleography.

### **X-Rays in the Diagnosis and Treatment of Cancer of the Bladder. G. E. Pfahler, M. D., Radiol. Rev. and Chicago M. Rec.**

The method which the author has used is called "pneumocystography." He describes the technic of this method in detail.

Malignant tumors are easily recognized, as that portion of the bladder wall does not expand. Practically all cases treated by x-ray up to the present time have been inoperable cases. The high voltage x-ray or highly filtered radium packs may be expected to accomplish most in destroying the tumor. In the use of high voltage x-rays, great care must be taken in measuring and directing dosage.

### **Abscess of the Lung. I. F. Weidlein and L. G. Herrmann, J. A. M. A., 91:850-853, Sept. 22, '28.**

Anaerobic organisms introduced into the bronchus is important in the production of chronic pulmonary abscess. Whether they reach the lungs by way of the air passages or blood stream is still unknown. Under experimental conditions, insufflated material must actually block the air passage completely, as well as injure the bronchi before an abscess can be produced. Arsenical drugs rarely, if ever, will cure pulmonary abscess in man, and this fact suggests that these organisms are probably secondary invaders. The inhalation of a foreign body will produce a bronchiectatic type of lesion. This usually can be successfully treated after the foreign body has been removed.

### **Studies in Thermopenetration by High Frequency Currents. E. N. Kime, Hosp. Progr. 8:453-455, Nov., '28.**

Diathermy through the lives, given with precautions as to technic of application, not to exceed physiological limits within the skin, produces a definitely measurable increase of heat.

Although at all times, and with all frequencies the subcutaneous temperature is much higher than the deep visceral temperature, this difference was much less marked when frequencies of lower rate were used, other factors such as electrode surface, amperage, and voltage being kept constant.

Current density as regulated by the circulation is the most important factor in the production of deep visceral heat, other factors being equal.

Quoting Binger, "We may say in answer to our original questions, that we have found no evidence of any significant degree of local heat within the lungs (or other viscera) except when their circulation has



been impaired or interrupted, and that all our experiments point to the fact that these currents actually pass through the deeper structures of the body."

Quoting Burton-Opitz, "Why speak of *degrees*? (rise of temperature) I do not see why the temperature should be raised four or five degrees because cellular oxidations are easily influenced by tenths of degrees. Even very slight changes in temperature often give results entirely out of proportion to the change."

**A Physical Therapy Department for a 200-Bed Hospital.** Louis Gries, *Hosp. Progr.* 9:446-450, Nov., '28.

It is not the purpose of this discussion to consider all of the aspects involved in the institution of a physical therapy department. Time does not permit the consideration of many of the angles which should be considered. We have therefore attempted to discuss only those problems with which one is confronted in planning the arrangement of apparatus and treatment rooms. To this end the division of the available space, selection of a director and technicians, choice of apparatus, etc., are considered in brief.

**The Spectrum of Electromagnetic or Radiant Energy and the Types of Radiation Used in Medicine.** W. S. Lawrence, *Hosp. Progr.*, 9:435-442, Nov., '28.

There has been presented a sort of bird's-eye view of the whole spectrum of radiant energy with its vast numbers of different wave lengths. What is generally known of the properties and uses of the rays constituting certain sections of the spectrum has been reviewed.

It has been noted that the properties and effects of certain wave groups very strongly suggest their use as therapeutic agents, and that this, coupled with observed clinical results, constitutes a reasonable basis for their use in medicine.

The prediction is ventured that the first quarter of this century will be looked upon as an era of great advances on scientific knowledge brought about largely by research in the field of radiation, and that in medicine it will be regarded as an era of physical therapy most of which has to do with certain portions of the spectrum of electromagnetic energy.

**Changing Conceptions of Chronic Ulcerative Colitis.** J. A. Bargaen, *J. A. M. A.* 91:1176-1181, Oct. 20, '28.

The evidence at hand indicates that chronic ulcerative colitis is an infectious disease due to a diplostreptococcus of characteristic morphologic and biologic properties. That it is a definite disease entity is no longer open to question.

The plea for early recognition of the disease, for the use of the proctoscope in all cases of rectal bleeding and for careful roentgenologic investigation by the barium enema in suspected cases of ulceration of the colon should be emphasized. In this way the disease can be definitely distinguished from other types of ulceration

of the colon and treatment can be instituted early, thus possibly avoiding some of the serious complications.

The treatment of patients with chronic ulcerative colitis is of vital interest to all physicians. It requires patience and careful observation over periods of months. If the patients are not kept under constant surveillance, they drift from one physician to another and often land in the hands of quacks. The treatment should be medical primarily. Surgery should be limited to complications or should be a life-saving measure for the patient who is failing progressively or who fails to improve after long continued treatment.

**Occupational Therapy.** H. E. Mock and M. L. Abbey, *J. A. M. A.* 91:797-801, Sept. 15, '28.

There surely is no doubt as to the therapeutic value of occupational therapy in the rehabilitation of the disabled soldier, and it is disappointing that the civilian hospitals have not profited more by the splendid results obtained in the army hospitals. The therapeutic value of occupational therapy as an aid in the rehabilitation of the disabled soldier was proved in thousands of cases. In these days when hospitals are crowded with just as serious cases, as well as the chronically disabling medical cases, occupational therapy and its sister, physical therapy, are equally essential for the rehabilitation of the disabled civilian. The medical profession should demand these adjuncts as a part of the hospital equipment.

**Sinusitis in Children.** S. L. Ruskin, *Am. J. Child. Dis.* 36:1029-1036, Nov. 1928.

Anatomically one must consider disease of the paranasal sinuses a condition affecting children at all ages.

Sinusitis in children produces three distinct clinical pictures: one caused by toxic absorption in chronic sinusitis; a second, by infection of the bloodstream in acute sinusitis, and a third, by infection of the cervical lymphatics.

Treatment in chronic sinusitis must be directed exactly to the sinus involved, and since empyema of the maxillary sinus is most frequent, irrigation of the antrums is the most useful measure.

Treatment in acute sinusitis should be conservative, with inhalation as the most useful procedure.

Prophylaxis is possible through the proper diet of the child, a normal calcium metabolism being maintained, and the careful avoidance of capillary shock through chilling.

**Allergy in an Infant.** G. M. Lyon, *Am. J. Child. Dis.*, 36:1012-1016, Nov. 1928.

The interesting features of this case may be summarized as follows:

The observation of the secretion of allergens in mother's breast milk with resulting allergic manifestations in an infant sensitive to those allergens.

The sensitivity in an infant and the lack of sensitivity in the mother as evidenced by the allergic reactions and protein skin tests. This is practically the

rule and probably explains the occurrence of early acquired, so-called "inherited sensitivity."

The influence of the epinephrine solution (1:1,000) on the condition when administered orally.

The sensitivity to white navy beans present in the child after two years, showing there has not been complete desensitization.

The inability to demonstrate the secretion of these allergens in milk of a cow fed liberally on a diet containing white navy beans and corn.

A sequella to an incomplete diet, which has not previously been pointed out. The diet was incomplete mainly because of the poor geographic and poor economic surroundings of the family.

The fact that the child reacts to white navy beans but can eat fresh string beans without allergic manifestations suggests that there is a different protein structure or "body" in the two foods.

The use of epinephrine solution with the withdrawal of the offending proteins from the mother's diet gave the best results.

This case is reported as being one of early acquired rather than inherited or congenital sensitivity.

#### **The Preventorium Child. I. D. Bronfin, Am. J. Child. Dis., 36:931-951, Nov. 1928.**

Active juvenile tuberculosis is still unrecognized in the majority of instances.

Physical signs of juvenile tuberculosis are indefinite and often misleading.

The history and symptoms are more important as a basis for treatment than physical signs.

The x-ray is of the greatest aid in diagnosis.

The practical solution of the problem of tuberculosis in adults depends in a large measure on the attention that is accorded children with latent or active tuberculosis.

All patients who have been exposed to the disease should have a limited period of residence in a suitable hospital or should be under continued close medical supervision even in the absence of symptoms.

Preventoriums for the observation of children who have been exposed and the treatment for juvenile tuberculosis are needed as urgently as sanatoriums for the treatment of adults with tuberculosis.

#### **Prenatal Factor and Rickets. A. F. Hess and M. Weinstock, Am. J. Child. Dis., 36:966-978, Nov. 1928.**

One hundred and seventy-seven children in attendance at a public school in Oakland, Calif., were chosen for measurement and supplementary feeding. The economic status of the families from which these children came is relatively low. About one-half of the children were seven per cent or more underweight for height.

Four groups were formed, one of which did not receive extra food, and the others of which received half a pint of milk, one orange and a small cracker sandwich, respectively, each school day for ten weeks.

Changes in weight and standing height were observed at the end of the period.

The children in all three groups given supplementary feedings made large gains in growth as compared with the controls. The groups fed on milk and crackers gained weight at about the same rate, and the group fed on oranges somewhat less. The group fed on oranges, however, made better gains in height than the others.

The girls in all groups and at all ages gained more in both weight and height than the boys.

The mere addition of extra calories furnished a measureable advantage for these children.

These results are compared with those found in former studies, and the inference is drawn that choice of supplementary lunch for a given group of children should be made only after careful consideration of home conditions and preferably after such preliminary observation as is here described.

#### **Therapeutic Methods and Results at Radiumhemmet. G. Forssell, Brit. J. Radiol., 1:374-377, Oct. 1928.**

Radiumhemmet is a small hospital of 34 beds for treatment of cancer by radiotherapy. It was founded in 1910 and it is maintained by the Stockholm Cancer Society. The organization is comprised of a department of control, which keeps track of the patients after they leave the hospital. The government co-operates with the hospital by paying the expenses of poor patients to and from the hospital.

Of 543 patients afflicted with sarcoma, 181 have remained free from symptoms, which were examined three to five years later. Of the 238 primary tumors only 58 have remained free from symptoms. These statistical data strongly confirm the palliative effect of radiotherapy in tumors.

#### **Isolated Tuberculosis of the Carpus. M. C. Mensor, Calif. & West. Med., 29:336-338, Nov. 1928.**

During the past 25 years, only three cases have been reported involving the carpal navicular.

A case is reported here of a girl, aged 14, with a history of having fallen on her palm and her hand was bent sharply backward. X-rays taken were negative and it was diagnosed as fracture. Seven weeks later she returned, complaining of persisting pain. X-ray studies were absolutely negative until four months later when the x-ray showed a definite "fracture" line. Operation was performed and two weeks later the patient was given local and general heliotherapy for four months. This case was diagnosed from operative findings as isolated tuberculosis of the carpus.

#### **Urinary Calculi in Children. C. K. Smith, J. A. M. A. 91:1431-1435, Nov. 10, 1928.**

Accumulating experience indicates that there is no essential difference between the urologic problems encountered in children and in adults.

Furthermore, the methods of cystoscopic precision in diagnosis and treatment are equally practical in children and in adults.

Calculi occur in practically the same ratio as in adults.

Routine roentgenograms should be made in all cases diagnosed as pyelitis, or when hematuria or persistent pain occurs.

The apparent tendency to recurrence warrants the elimination of all focal infection, the maintenance of good urinary drainage and frequent re-examination.

#### **Ureteral Stricture as a Complication in Cancer of the Cervix. C. L. Martin, J. A. M. A., 91: 1537-1541, Nov. 17, 1928.**

Approximately 80 per cent of all patients with cancer of the cervix treated by all methods eventually succumb to the disease.

In this group of cases, strictures of the ureters producing pain and eventually uremia and death are the most important complications.

Irradiation should be directed vigorously toward the broad ligament regions in an effort to prevent ureteral involvement.

After the complication appears, dilation through a cystoscope, indwelling catheters, ureteral transplants, nephrostomy and ureterostomy may relieve pain and prolong life.

#### **Leiomyosarcoma of the Uterus. W. T. Dannreuther, J. A. M. A., 91:1532-1537, Nov. 17, 1928.**

Various types of sarcomatous cellular transformation occur in a small percentage of uterine tumors.

Leiomyosarcomas do not initiate pathognomonic clinical symptoms.

A leiomyosarcoma should be suspected when a uterine neoplasm presents unusual friability of the broad ligaments, remarkable vascularity of the tumor, absence of a sharp line of demarcation between the tumor and the myometrium, difficulty in shelling out the tumor from its apparent circumscribed limits, all opaque appearance on section, and an edematous and sparsely fasciculated appearance of the cut surface, which is softer than that of a myoma.

All uterine mural tumors should be cut and inspected during hysterectomy, before one decides to leave the cervix.

It is illogical for the surgeon to attempt to differentiate between "histologic" malignancy and "clinical" malignancy.

The numerical incidence of mitotic figures may be accepted as a fairly reliable index of the malignancy of a particular tumor.

The hysterectomy should be wide and complete in every case in which the slightest suspicion of malignancy can be legitimately entertained.

When the cervix has been left inadvertently, and further therapeutic measures seem desirable, radium therapy is preferable.

#### **Jejunal and Gastrojejunal Ulcer and Their Associated Roentgenologic Signs. J. D. Camp, J. A. M. A., 91:1436-1439, Nov. 1928. 1439, Nov. 1928.**

The importance and apparent frequency of the niche or crater deformity in the jejunum or stoma as a positive sign of jejunal or gastro-jejunal ulceration—jejunal ulceration has not been emphasized in the past except by a few observers. Others have doubted its frequent existence in these lesions. In this series a niche was definitely demonstrated by the examiner in eight of ten consecutive cases diagnosed as positive by the roentgenologist. In seven instances the niche was located in the jejunum and in one it was found in the stoma. Five patients were operated on and an ulcer corresponding to the niche shadow in the jejunum was found in each. The results of these observations suggest that the niche deformity is frequently present. As it represents irrefragable evidence of disease, its presence should be sought for in all cases.

#### **Pyleography. M. B. Wesson, Calif. & West. Med. 29:297-303, Nov. 1928.**

Ten years ago pyleography was considered a dangerous surgical procedure. Today, because of the innocuousness of the reagents used, a large number of the general practitioners do their own pyleographies.

Pyleography is ordinarily a simple "fool proof" procedure, but cystoscopy is not, and complete anuria and deaths follow urethral instrumentation and are then attributed to the lavaging of the kidney pelvis with sodium iodid—a harmless intravenous agent.

The use of warm or hot water as an irrigating medium, results in fogged lens and soft catheters. The bladder is relatively not sensitive to cold water and the irrigating solution would never be above room temperature.

Three quick ways of spoiling catheters are sterilization by soaking them in a container connected to a receptacle of formaldehyd, by boiling them, or by subjecting them to a prolonged soaking in bichlorid of mercury solution. Twelve per cent sodium iodid is a harmless and satisfactory pyleographic media. Fifteen to 25 per cent sodium bromid as a pyleographic medium represents potential danger and discomfort to the patient. Double pyleograms are necessary so that the two kidneys can be compared. Bilateral bizarre shapes, etc., are congenital but unilateral ones indicate a pathologic condition. Double pyleograms can be taken with impunity in any case that has been subjected to bilateral ureteral catheterization.

The most satisfactory method of injection is by the gravity method, using two burettes held in a stand at a height of 18 to 24 inches above the patient. When the fluid stops running the kidney pelvis is filled, and this may take one minute or five minutes. With a syringe there is generally over-injection, which spoils the picture and causes the patient discomfort for a few hours. The same is true of a gravity burette held by a nervous or impatient assistant, for the tendency is to



elevate it and hurry the filling.

Six cases are reported in abstract with pictures: (a) Diverticula of bladder with reflex to left pyonephrosis; (b) Hydronephrosis of right kidney, due apparently to aberrant artery. Passage of catheters caused anuria of normal left kidney. (Fortunately, a pyelogram of left kidney alone was not done.) (c) Bilateral renal lithiasis, small stone in uninfected, non-functioning kidney, staghorn in infected functioning kidney. (d) Over-injection with 24-inch gravity pressure, the solution spraying out through or between the tubules. (e) Congenital bilateral ptosis of kidney. Unilateral pyelogram resulted in nephropexy and four years later kidney had resumed approximately its former position. (f) Calcified hematoma symptomless until the picture was seen by the neurotic individual.

**Prevention of Rickets. A. D. Holmes, E. T. Wyman, L. W. Smith and M. G. Pigott, Am. J. Child. Dis. 36:952-965, Nov. 1928.**

A comparison has been made of the mineral metabolism of seven groups of rats, controls, direct irradiation and direct irradiation plus 14.8, 4.9, 14.8, and 29.7 mg. cod liver oil, respectively, which were maintained for thirty-six days, after weaning, on a rachitic-producing diet and on the same diet supplemented with ultraviolet light or cod liver oil.

As judged by the growth, roentgenograms of the femur and tibia, the mineral metabolism of the controls was decidedly inferior to that of the animals receiving the rachitic diet supplemented with ultraviolet light or cod liver oil. Aside from the control group, the average increase in body weight during the thirty-six-day experimental period was greatest for the group fed 19.8 mg. of cod liver oil and least for the group receiving direct irradiation and the group fed 14.8 mg. of cod liver oil.

The roentgenograms of the right femur and tibia of the groups of animals other than the controls show little if any difference in the extent of calcification.

The calcium content of the blood serum of the groups other than the controls is in rather close agreement. The phosphorus content of the blood serum for the group receiving direct irradiation is definitely higher than that of the controls, but materially lower than that of the other five groups. The product of the calcium and phosphorus content of the blood serum is 37.7 per cent for the controls and 63.7 per cent for the group receiving direct irradiation, and for the remaining groups it is in excess of 84 per cent. The highest values, 89.6 and 89.9 per cent, were for the groups receiving direct irradiation plus 14.8 mg. of cod liver oil and 29.7 mg. of cod liver oil, respectively.

In general, then, the results here reported show that 5 mg. of the cod liver oil under consideration has sufficient antirachitic activity to protect laboratory ani-

mals against rickets when maintained under the conditions described. The results also indicate that 5 mg. of the oil under consideration gives greater protection than fifteen minutes of irradiation with ultraviolet light at a distance of 36 inches, and that 5 mg. of the oil appears to be as effective as larger amounts when used as a protection against rickets.

In conclusion, attention is earnestly directed to the fact that the results herein reported apply only to the ultraviolet irradiation conditions and the cod liver oil used in this investigation, and that many additional data are required before a general comparison can be made between the antirachitic value of ultraviolet light with that of average medicinal cod liver oil.

**Healing in Infantile Scurvy as Shown by X-Ray. S. McLean and R. McIntosh, Am. J. Child. Dis., 36:875-930, Nov. 1928.**

The types of disturbances which may be found in roentgenograms of the long bones in infants with scurvy have been enumerated, and their modulations during the process of healing described.

A series of 115 roentgenologic examinations in 52 patients with scurvy are analyzed, with particular reference to the variation in the picture according to the stage of the disease.

The relative value of the x-ray signs of scurvy from the point of view of diagnosis in acute cases and the relative frequency of the various signs presented for all stages of the healing process for our series are discussed.

The period covered by this analysis ranges from the first day of active antiscorbutic treatment to twelve years later.

The series is briefly analyzed from the point of view of symptomatology and physical manifestations.

**Early Roentgen Observations in Duodenal Ulcer. E. L. Jenkinson, J. A. M. A. 91: 1716-1718, Dec. 1, '28.**

As a result of this study, the author believes that the following conditions are least suggestive of early duodenal ulcer.

An irritable and spastic duodenal bulb which has a tendency to stay empty.

Difficulty in keeping the bulb filled in order to observe it closely.

The ability of the bulb to fill and to become regular in outline under pressure with the examining hand.

Temporary spasm of the pyloric antrum, the antrum being regular in outline.

Peristaltic waves, which may be active in some cases and normal in others.

One should not let the roentgenographic evidence outweigh the fluoroscopic observations. It is well to have the courage of one's convictions.